Telephony.

AN ILLUSTRATED MONTHLY TELEPHONE JOURNAL

VOL. III. CHICAGO, FEBRUARY, 1902. No.

NORTHWESTERN CEDARMEN'S CONVENTION.

The sixth annual convention of the Northwestern Cedarmen's Association was held at Menominee, Mich., January 7, and was one of the most successful in the history of the organization. President Worcester, in his annual address, congratulated the cedarmen on the prosperity enjoyed during the past year and commented on the demand for everything produced from the cedar tree. After speaking of the depleted stocks and the difficulty of supplying the demand for cedar product, he said:

"Under these circumstances it is not surprising that the majority of the members of this association have experienced an exceptionally prosperous year's business and I trust that this experience will weld the members more closely together and confirm all in the belief that our association is something more than a name, and that although in the main the condition of our business is due to the general prosperity of the country, in many ways the association has worked to educate its members and elevate the business until it ranks as a leading division of the lumber industry of this country."

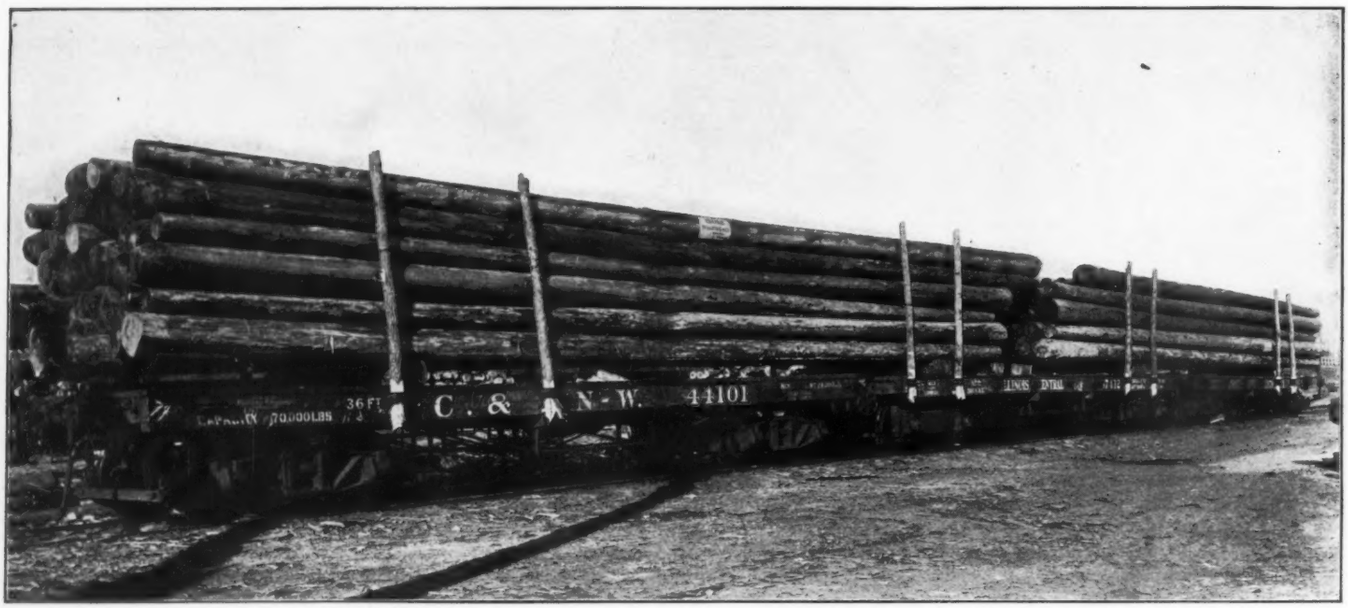
DELEGATES NORTHWESTERN CEDARMEN'S ASSOCIATION, MENOMINEE, MICH.

President Worcester cited the present membership as sixty-three firms, whose cedar product sales during last year approximated $10,000,000, in contrast with those of a few years ago, "when probably $1,000,000 would have bought all the cedar produced in the great lakes territory" and when "fully one-half the cedar stumpage in this

territory could have been bought for the single consideration of paying the taxes on the land." He commented on the rapidly increased value of cedar stumpage and the growing substitution of cedar shingles for those of pine, the increased use of cedar and of poles for general electrical construction, creating a demand estimated at 2,000,000 poles last year. Western farmers' prosperity, he said, absorbed about 90 per cent of the stock produced during the winter of 1900-1901, particularly for the larger posts, leaving the smaller sizes little called for, the same prosperity stimulating the building of many local telephone lines, absorbing the overstock of the fall of 1900 and almost the entire production of the winter of 1900-1901. Continuing, he said:

"Altogether the outlook for the year is very favorable. Prices are upon a very satisfactory basis. The general prosperity of the farming communities bids fair to continue the brisk demand for posts, small poles and shingles, while the railroads, with constantly increasing earnings, will continue to improve their roadbeds, build new extensions and absorb the cedar tie output.

"If but a small proportion of the electric railroads now projected on paper reach the building stage the demand for large poles will fully equal the production. It is probable that this winter will be a record breaker in the production of white cedar products, and it is well for the members to bear in mind that the country can have too much of a good thing



TRIPLE CARLOAD OF CEDAR POLES FROM THE VALENTINE-CLARK COMPANY.

TRADING STATION IN NORTH CAROLINA—STANDARD POLE & TIE COMPANY.

and that should anything unforeseen happen to disturb the present favorable conditions an overstock would mean what it always means—hardship for many and failure for a few."

Mr. Worcester called for better support of the statistical work of the association, and congratulated the membership on the general acceptance by the consuming trade of the association rules for inspection. Association inspectors had been called upon in but few instances to adjust differences, and in but one instance had the decision of the official inspector been rejected by the consignee. The president concluded:

"In conclusion, I wish to say that it has been a great pleasure to preside over this association during the past year, and it is sufficient for me to hope that the members will experience during the year 1902 a season as prosperous as that of 1901."

The secretary made a brief annual report, reviewing the work done the past year in keeping the members in touch with one another and with the workings of the secretary's office. He referred to the effort made to interest the cedarmen of Southern Michigan in the organization and expressed the hope and belief that a number of them would soon be enrolled on the membership list and thus give the association additional weight with the railroads in the efforts to secure needed reforms and with the trade at large. He had expected that several of the large concerns of Saginaw and Bay City would be represented at the meeting.

He hoped that members would more generally reply this year to the request for statistics concerning stock on hand, that the totals might in the future be used for the guidance of the members in planning their operations. In conclusion, he spoke of the increased call upon the secretary from the trade at large for copies of the cedar specifications, evidencing a general desire upon the part of the trade to conform to the specifications. The association, he said, had grown steadily in membership the past year, the number of members increasing from fifty-two to sixty-three, with five applications for membership on hand to present to the meeting.

Treasurer H. W. Reade presented his annual report, showing the financial condition of the association to be excellent, there being a balance on hand.

The secretary presented the report of the meeting of the board of directors. The board of directors authorized the revision and publication of the classification books, showing the freight rates to all middle and western points. They also recommended changes in the constitution and by-laws of the association, all of which were adopted. Article II of the constitution, regarding eligibility to membership, was amended to read as follows:

Any person or firm who is regularly engaged in the business of selling cedar products to what is commonly known as the general car trade, and who regularly carries stock for this purpose, may become a member of this association by subscribing to the constitution and paying the membership fee and the annual dues prescribed by the by-laws. Any member who has paid his annual dues may withdraw from membership by giving notice to the secretary in writing and surrendering his membership certificate, but membership shall not be transferrable. Any member of this association, who by change in the conduct of his business, does not conform to the above requirements for eligibility of members, shall cease to become a member. A majority of the board of directors shall pass upon all applications for membership in this association and shall also pass upon and have power to remove from membership in this association any member who shall cease to fulfil the requirements of membership.

In Article III of the constitution the word "treasurer" was substituted for "secretary," thus making the treasurer ex-officio a member of the board of directors instead of the secretary.

Several additional by-laws were adopted, providing for permanent committees on post and shingle and pole prices, on railroad matters and on official inspection. A by-law was also added providing for the payment of the traveling expenses of directors and committeemen in attending special meetings.

G. L. Lindsley, chairman of the pole committee, read to the meeting the following comment on the inspection rules, which came from the official inspection committee. The matter was approved and ordered printed and circulated among the trade:

POLES.

The phrase "reasonably sound" occurs again in the pole specifications and is meant to cover occasional pencil holes in the tops of poles. When these holes, which are very common in cedar, do not affect the strength of the pole they are not considered a defect.

Live Timber.—One of the most important items in the inspection of poles is to be sure that when the tree was cut it was alive and growing. Live cedar always has a ring of white sap wood surrounding the heart wood. No matter how unsightly or discolored the exterior of the pole may be, a shaving from a live pole will show white sap wood. It occasionally occurs that a dead streak will be found on a pole, caused by injuries to the growing tree. If the dead sap wood covers only a small part of the circumference and is shallow, not extending into the heart of the tree, it does not necessarily affect the strength of the pole, but a pole encircled with gray dead sap wood is brittle without elasticity and unfit to bear any strain.

Measurement.—All 4-inch top poles are classed under rules relating to shed poles and are measured by top diameter in same manner, the rules admitting poles 3¾ inches in diameter as 4-inch poles. The first size on the list of standard telegraph, telephone and electric-light poles is what is called the 5-inch pole, and for this size and all larger poles the measurements are given in circumference figures.

For purposes of brevity, the terms 5-inch 25-foot, 6-inch 25-foot, etc., are used, but with poles of this size the top diameter is not a correct means of measurement, as the tops are not exact circles, but sometimes vary a full inch when measured at different points

The standard circumference of a 5-inch pole is 15 inches. Frequently poles will be found full 15 inches circumference which measure in diameter less than 5 inches.

In measuring poles the tape should be used to ascertain the circumference of the top, which should be not less than measurements given in specifications for the size of the pole under consideration. This method of measurement is in common use with all the large companies and is generally well understood, but occasionally some of the companies use a straight rule to measure diameter only, with the result that in a lot of 5-inch poles they may find a few not full 5 inches in diameter, but if these poles were measured by tape they would be found fully up to specifications. The use of the terms, 5, 6 and 7-inch tops is misleading and circumference measure should be used.

Butt Rot.—The association specifications admit butt rot to the extent of 10 per cent of the total area of the butt. This is usually satisfactory, but it is impossible to frame a set of rules for inspection of butt rot that will apply in all cases. Nearly all cedar trees of any size have rotten hearts at the butts. Usually this rot does not extend more than 4 or 6 feet upward into the tree. It sometimes occurs that a butt will show very rotten without extending into the pole sufficiently to weaken it.

Crook.—The rules for the measurement of crook are generally understood. They admit a crook one way of 5 inches on a 25-foot pole, 6 inches on a 30-foot pole, 7 inches on a 35-foot pole, measuring the crook from a point 6 feet from the butt to the top of the pole.

The following report of the special committee appointed at the October meeting to revise pole weights was presented by E. L. Clark and adopted:

Your pole committee on weights, appointed by President Worcester, met in Chicago, Dec. 27, 1901, and after carefully canvassing the matter of weights and making compari-

C. B. BROOKS.

W. J. CARNEY.

E. L CLARK.

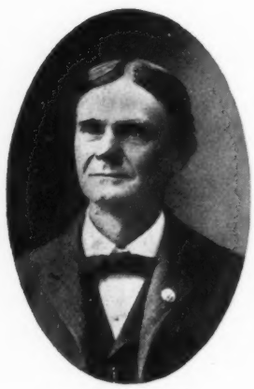
M. B. CROSS.

M. H. COOLIDGE.

W. J. DAVIS.

JOHN H. FOWLER.

W. H. HOLCOMB.



C. C. HOUSTON.

E. E. KAUFMAN.

W. G. LIGGETT.

G. L. LINDSLEY.

HARRY W. LOBB.

G. M. MASHEK.

WILLIAM MUELLER, JR.

WILLIAM MUELLER.

A. F. NAUGLE.

E. E. NAUGLE.

H. W. READE.

O. W. SMITH.

sons as to their experiences as regards the weight of cedar poles, as totaled by the various members whom they represent, would suggest that the following weights be used as standard for the Northwestern Cedarmen's Association:

20	feet	4-inch tops	100 pounds each.
20	feet	5-inch tops	130 pounds each.
25	feet	4-inch tops	150 pounds each.
25	feet	5-inch tops	200 pounds each.
25	feet	6-inch tops	250 pounds each.
25	feet	7-inch tops	350 pounds each.
30	feet	5-inch tops	275 pounds each.
30	feet	6-inch tops	350 pounds each.
30	feet	7-inch tops	450 pounds each.
35	feet	6-inch tops	450 pounds each.
35	feet	7-inch tops	600 pounds each.
40	feet	6-inch tops	625 pounds each.
40	feet	7-inch tops	800 pounds each.
45	feet	6-inch tops	835 pounds each.
45	feet	7-inch tops	1,000 pounds each.
50	feet	6-inch tops	1,035 pounds each.
50	feet	7-inch tops	1,250 pounds each.
55	feet	6-inch tops	1,300 pounds each.
55	feet	7-inch tops	1,550 pounds each.
60	feet	7-inch tops	2,000 pounds each.
65	feet	7-inch tops	2,700 pounds each.
70	feet	7-inch tops	3,400 pounds each.

Respectfully submitted.

E. L. Clark, Chairman.
William Mueller, Jr.,
A. D. Watson.

R. H. Downing, chairman of the railroad committee, reported that the committee had presented considerable data to the chairman of the Western Trunk Lines Committee to show that the minimum weights on 30 and 34-foot cars are excessive, and he had been assured by that official that the matter would have the earnest attention of the freight officials at their next meeting. Mr. Downing added that he had talked the matter over with such of the freight men as are located in Minneapolis, and they had assured him of their belief in the justice of his claims. So he believed the shippers of cedar would soon receive relief.

The nominating committee, of which E. L. Clark was

W. J. STITT.

E. H. VALENTINE.

chairman, reported the re-election of the old officers, as follows:

President—C. H. Worcester, Marinette, Wis.

Vice-President—R. H. Downing, Minneapolis.

They also recommended the following directors: J. K. Wright, Marinette, Wis.; H. S. Gilkey, Janesville, Wis.; J. C. Kirkpatrick, Escanaba; A. D. Watson, Chicago.

The officers and directors, as recommended, were declared elected by vote of the meeting, Mr. Worcester protesting against his re-election and retiring from the chair while the secretary called for a vote. He was called upon for a speech, and in response thanked the members for the double honor paid him. The president then reappointed the old standing committees for another year, after which the meeting adjourned. The committees for 1902 are as follows:

Posts and Shingles—C. H. Worcester, chairman; F. J. Lang, R. H. Downing, Daniel MacGillis, J. K. Wright.

Poles—G. L. Lindsley, chairman; William Mueller, Jr., H. W. Reade, D. M. Fullmer, E. L. Clark.

Official Inspection—William Mueller, chairman; R. H. Downing, J. K. Wright, H. W. Reade.

Railroads—R. H. Downing, chairman; Daniel MacGillis, H. S. Gilkey.

At the conclusion of the meeting the board of directors

T. P. WALL.

C. H. WORCESTER.

held a brief session and re-elected H. W. Reade, Escanaba, treasurer, and Fred H. Gilman, secretary. Mr. Gilman desired to retire from the secretaryship, owing to not having the necessary time to devote to the work, but the directors declined to consent to his retiring.

After the conclusion of the meeting a banquet was served in the S. M. Stephenson hotel. The full list of those in attendance follows:

R. M. Andrews, Menominee; T. H. Anthes, Torrey Cedar Company, Clintonville, Wis.; J. L. Bertles, Jr., Wolverine Cedar & Lumber Company, Menominee; W. H. Bissell, Erickson & Bissell, Escanaba; W. P. Bowring, C. H. Worcester & Co., Marinette, Wis.; A. W. Brandt, A. W. Brandt, Faithorn Junction, Wis.; B. W. Brown, MacGillis & Gibbs, Escanaba; T. A. Bruett, Wilbur Lumber Company, Milwaukee, Wis.; Ira Carley, Ira Carley, Ingalls; L. F. Chapman, Holcomb-Lobb Company, Escanaba; E. L. Clark, Valentine-Clark Company, Chicago; M. B. Cross, Francis Beidler & Co., Chicago; A. E. Darling, Chicago Lumber & Coal Company, Minneapolis; F. F. Davis, Holcomb-Lobb Company, Masonville; R. H. Downing, Bradley-Watkins Company, Minneapolis; O. Erickson, Erickson & Bissell, Escanaba; D. M. Fullmer, D. M. Fullmer Lumber Company, Florence, Wis.; R. R. Genge, Francis Beidler & Co., Chicago; E. H. Gilkey, Pendleton & Gilkey, Janesville, Wis.; H. S. Gilkey,, Pendleton & Gilkey, Janesville, Wis.; Fred H. Gilman, Minneapolis; M. H. Grover, Garth Lumber Company, Garth; John Gwennap, W. U. T. Co., Chicago; Henry Hannefelt, Ira Carley, Ingalls; W. W. Harmon, Menominee, Mich.; George Harter, George Harter & Son, Faithorn Junction, Wis.; C. J. Huebel, C. J. Huebel & Co., Menominee; W. H. Kiernan, E. E. Naugle Tie Company, Menominee; Allen Kirkpatrick, Oshkosh; J. C. Kirkpatrick, Pittsburg & Lake Superior Iron Company, Escanaba; F. J. Lang, Wisconsin Land & Lumber Company, Hermansville; E. M. Leroy, Marinette, Wis.; C. P. Lindsley, Lindsley Bros. Company, Spokane, Wash.; G. L. Lindsley, Lindsley Bros. Company, Menominee; W. R. Mackenzie, Brittingham & Hixon Lumber Company, Madison, Wis.; Daniel MacGillis, MacGillis & Gibbs, Milwaukee, Wis.; J. P. McGoldrick, McGoldrick Lumber Company, Minneapolis; William Mueller, Jr., William Mueller Company, Chicago; A. T. Naugle, E. E. Naugle Tie Company, Chicago; E. E. Naugle, E. E. Naugle Tie Company, Chicago; Joseph Naugle, E. E. Naugle Tie Company, Chicago; James O'Callahan, O. C. Lumber Company, Vulcan; M. M. Parkinson, Parkinson Cedar

Company, Madison, Wis.; H. F. Partridge, T. M. Partridge Lumber Company, Minneapolis; Paul Perrizo, Perrizo & Sons, Daggett; M. Perron, M. Perron, Perronville; F. W. Raber, Raber & Watson, Chicago; H. W. Reade, Pittsburg & Lake Superior Iron Company, Escanaba; Joseph Reinger, Escanaba Lumber Company, Escanaba; James R. Roper, Ira Carley, Ingalls; S. B. Sanderson, Francis Beidler & Co., Chicago; Frank N. Snell, F. N. Snell, Milwaukee, Wis.; C. L. Sporley, Negaunee; Thomas Wall, Torrey Cedar Company, Clintonville, Wis.; F. W. Werner, Bradley-Watkins Company, Minneapolis; George Wilson, Holcomb-Lobb Company, Chicago; C. H. Worcester, C. H. Worcester & Co., Marinette; J. K. Wright, Wright Bros., Marinette, Wis.

The following applications for membership were presented and accepted:

I. Stephenson Company, Wells, Mich.
Francis Beidler & Co., Chicago.
Chicago Lumber & Coal Company, St. Louis, Mo.
E. E. Naugle Tie Company, Chicago.
Wolcott Bros., Manchester, Iowa.

THE STANDARD POLE AND TIE COMPANY.

The Standard Pole & Tie Company, No. 44 Broad street, New York City, was incorporated in New Jersey, June 21, 1900. The officers are: President, Henry Merritt, Jr.; vice-president, E. G. Chamberlain; secretary-treasurer, Fred L. Merritt. The company handles octagonal yellow pine poles, round south white cedar or juniper poles, yellow cross-arms, locust and oak pins, oak brackets, yellow pine, oak and chestnut ties.

The company furnished material to the following concerns, and one that is particularly worthy of note is the trolley line built for the Maimi & Erie Canal Transportation Company, built by the Cleveland Construction Company, and runs from Cincinnati to Toledo, in which the Standard Pole & Tie Company supplied 40-foot poles It has also supplied material for the following:

Chicago, Aurora & Elgin Railway, Cleveland & Southern Railway, Southern Ohio Railway, Federal Telephone Company, Edison Electric Company of Brooklyn, Western Ohio Traction Company, General Electric Company, West India Lighting Company, Jamaica, Columbus, London & Springfield Railway. The company, in view of the immense business it is doing, can quote rock bottom prices on product.

The illustration on page 34 shows a raft of the company's poles landing at one of its North Carolina yards.

NEW LONG DISTANCE COMPANY.

BY FRED DE LAND.

The Kansas Long-Distance Telephone & Telegraph Company of Topeka is organized for the purpose of affording ample long-distance facilities to the many operating Independent telephone companies in Kansas and to build long-distance lines in the adjoining states, or to arrange for an interchange of business between this company's system and the long-distance systems of other states. These long-distance lines will be strongly built, according to the latest standard specifications, with metallic circuits of heavy copper, and the large number of circuits strung will afford ample talking facilities to all users.

As soon as the work of construction is well under way the Kansas Long-Distance Company will send a representative to confer with operating Independent telephone companies and to offer agreements covering an equitable interchange of business. Any and all traffic agreements signed will be open to the inspection of all companies directly interested. No person has yet been asked to sign a traffic agreement, or presented with a copy of any prospective agreement.

Exclusive traffic agreements are not desired, nor is it wise for any Independent exchange to enter into exclusive contracts. In fact, any long-distance or exchange company that is legitimately independent of the Bell will not demand exclusive rights. The very existence of an Independent company is founded on its not being a monopoly, but working to and for the common welfare of the telephone-using public.

The rates will be about 25 per cent lower than the present Bell rates, and the minute-rate system will be introduced; that is, patrons who prefer to talk only a minute need pay only for the time they are actually on the line. As a person can easily speak 130 words a minute, it is needless to say that this system will be heartily supported by business men in the transmission of orders. This system has proved an entire success in other sections, especially in California, where it was introduced by General Sabin.

Any company or any individual may rent one or more long-distance circuits for its or his exclusive use, but certain circuits on each line will be open day and night for the use of any and all who desire high-class telephone service.

Construction work will begin about March 1. Maps showing routes along which our long-distance lines will pass are now being prepared. The law compels us to open toll stations in each county seat through which our lines pass, and we shall endeavor to have these county seats connected up as soon as possible. It is our intention to open toll stations only in cities where there is no legitimate Independent exchange, or where the local exchange cannot use our lines by reason of a prior exclusive agreement.

We are in the market for the purchase of sixty cars of poles to be delivered in March, and for two cars of cross-arms and pole-line hardware, while to build the lines we have planned to complete during the next twelve months will require 310 cars of poles and 15 cars of cross-arms, pins, insulators and hardware, to say nothing of hundreds of miles of heavy copper wire. Then the payroll of our company for the current year will probably approximate $50,000.

We are now organizing the accounting department, the engineering department and the right-of-way department. As soon as these departments are well in hand we shall organize the construction department and later on form an equipment department. Finally, we shall organize the traffic department. But though the traffic department is the last to be formed, it will be one of the most important of all the departments, for on its successful management depends to a large extent the amount of revenue we shall receive.

We are now being cordially welcomed by the Independent exchanges and every effort is being put forth to facilitate the success of our plans and to aid in the rapid progress of the work of construction.

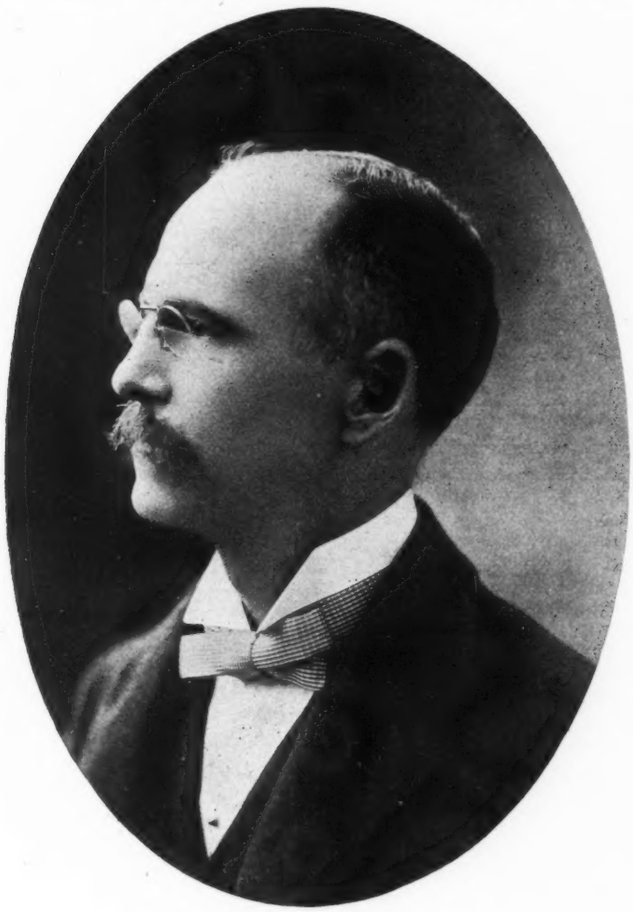
TELEPHONIC ENGINEERING AT PURDUE UNIVERSITY.

Supplementing the announcement of the new course in telephony at Purdue University, which appeared in our issue for December, 1901, it is proper that the following statement should be made: The course in Telephony was inaugurated by the trustees of the university upon the recommendation of the Faculty of the School of Electrical Engineering. This recommendation was made only after a very careful investigation of the needs of telephone manufacturers and operating companies in the way of trained experts. The plan and scope of the course embody the ideas of a large number of men prominent in telephone circles.

Professor Goldsborough made a special trip to Washington for the purpose of consulting with Alexander Graham Bell, and Messrs. S. G. McMeen. F. R. McBerty, Kempster B. Miller and W. E. Doolittle were good enough to give ungrudgingly to the university the benefit of their very wide experience in telephone matters. To these gentlemen, in a great measure, is due the decisive step which was taken by the trustees inaugurating the new department at the university.

A SUCCESSFUL TELEPHONE MAN.

Mr. H. A. Douglas, whose portrait we present herewith, is one of the well-known telephone men in the United States. His first experience in the telephone business was with the Chicago Telephone Company, beginning as a messenger boy. He worked himself up until he became superintendent of the company. When the Independent telephone movement began to assume proportions, Mr. Douglas resigned his position with the Chicago Telephone Company to accept the position of superintendent of construction of the Citizens' Telephone Company of Grand Rapids, Mich. After the plant was completed and in successful operation he went to Atlanta, Ga., where, as manager of the Southern Standard Telephone Construction Company, he built



H. A. DOUGLAS.

what is acknowledged to be one of the largest constructed Independent telephone exchanges in the South. After finishing the Atlanta plant Mr. Douglas went to Detroit, taking a prominent position with the People's Telephone Company, with which company he remained until the first of the present year, when he accepted the position of general superintendent of the Independent Telephone Company at Seattle, Wash., which is building one of the most modern exchanges on the Pacific coast. It is the intention of the company to cover all the coast territory with toll lines, building exchanges in practically all the cities and towns.

MILITARY TELEPHONES.

We notice in the Gazette de l'Electricien a long description of the military telephone system which has been devised by Captain Charollois of the French army, says the London Electrical Engineer. In this article the editor points out that there are two systems of military telephones in use in France, the first of which is recognized officially, while the other, to which we refer above, is the outcome of private enterprise and is not recognized as a government system. The authorized military telephones are equipped with batteries, insulated wires and other costly accessories, which are required to give a permanent connection in all states of weather between military outposts. The object of the system devised by Captain Charollois is, however, to obtain a cheap and regular connection between a moving force and headquarters. With this end in view, he uses an insulated wire, which in dry weather is laid direct on the ground. The diameter of this wire is only 6-10 mm. and its weight 8¾ pounds per mile. This enables a man to carry some four or five miles of wire, which is wound on a drum, which can be of exceedingly light construction. Experiments are quoted to show that the system has been exceedingly successful, even when the wire has been laid on a road over which other troops have had to pass. In one instance some 17 miles were laid and taken up again in the course of a day. The whole question arises, however, as to how far this bare wire, with earth as return, is available in wet weather. We gather that Captain Charollois advises its being supported on trees or houses in times of rain, but it seems to us, after all, that an insulated wire laid on the ground is likely to be of more permanent service. Our corps of electrical engineers has obtained experience in telephone work in the South African war with the use of such insulated wire laid direct on the ground. It will be remembered that Colonel Crompton devised an attachment on a bicycle which enabled the wire to be rapidly paid out across the veldt. In this case the drum was arranged to carry about two miles of bare copper wire. It was found that a cyclist could ride along at the rate of 10 to 15 miles an hour and lay the wire behind him, without any fear of kinking or breaking. After use the wire was picked up by hand at the rate of about four miles an hour. The use of the telephone in South Africa has shown that with a bare copper wire, and using the earth as the return circuit, one can speak for three or four miles with the wire trodden into wet ground and even with a broken wire. The Electrical Engineer Volunteers' contingent was eminently successful in the use of bicycles for laying the wires, and great advantage was derived from being able to provide speaking communication between two fixed points with such dispatch.

IOWA TELEPHONE CONVENTION.

The Iowa Telephone Association will hold its sixth annual convention at the Savery House, Des Moines, Iowa, on March 11 and 12. The principal discussion will be on the establishment of a central checking bureau or clearing house for all the toll line business, something on the principle of the clearing house for banks. The rural telephone line proposition will be thoroughly discussed. Other important telephone subjects will come before the meeting. A large attendance is expected. Many of the manufacturers and supply houses will make exhibits. The officers of the association are: H. C. Rainey, Fairfield, president; A. T. Presson, Iowa City, vice-president; Charles C. Deering, Boone, secretary and treasurer.

A PERMANENT INJUNCTION.

Judge Tuley has made permanent his temporary injunction against the Chicago Telephone Company, which forbids it charging more than $125 per annum for service. It will be remembered that the telephone company had advanced its rates because of improvements which it claimed to have made at great expense. The city ordinance fixes the maximum charge at $125, and Judge Tuley holds that the company must not disregard this law.

It is reported that the telephone line connecting Milan, Turin and Paris is nearing completion, and will shortly be opened. This line passes over Mont-Cenis. It will be the first international telephone connection with Italy. Connection is also to be established between Milan and Zürich, to complete which there remains only the section between Como and Chiasso to construct.

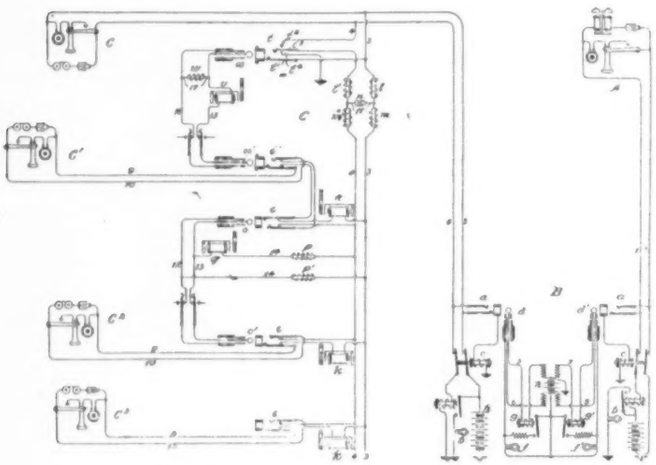
DIGEST OF TELEPHONE AND KINDRED PATENTS

CONDUCTED BY EDWARD E. CLEMENT.

684,111.—C. E. Scribner and J. L. McQuarrie. Telephone Exchange System.

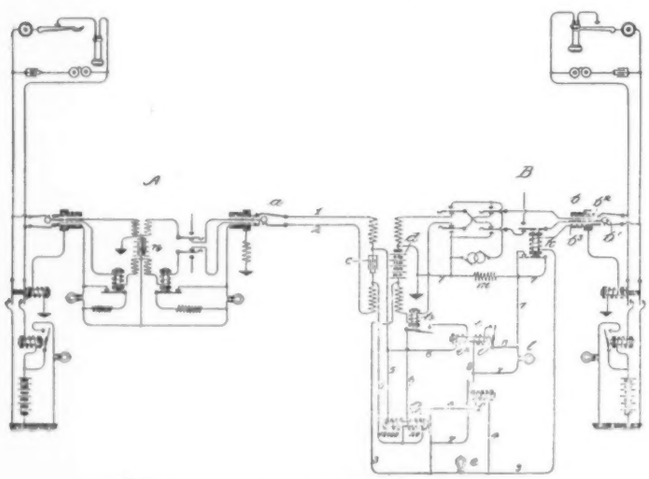
This is a scheme for supplying a branch exchange with current from a central office over an ordinary subscriber's line, leaving it possible to use this line and the lines of the branch exchange simultaneously without interference, or to plug any of the branch lines onto this line as a trunk, to reach central.

In the diagram B is the central office and C', etc., is a



684,111—TELEPHONE EXCHANGE SYSTEM.

branch exchange having local subscribers' lines circuits 9-10. The branch exchange proper is shown at C, branch supply wires taking current from the main lines 3-4 and extending through the jack t. This jack normally cuts off the branch 4 at open contact t2, and grounds the extension through the closed contact t4. The local subscriber C' has his line wires 9-10 extending to the branch exchange switchboard, terminating at the jack i, after passing through the jack i', the anvils of the jack i being connected to the sup-



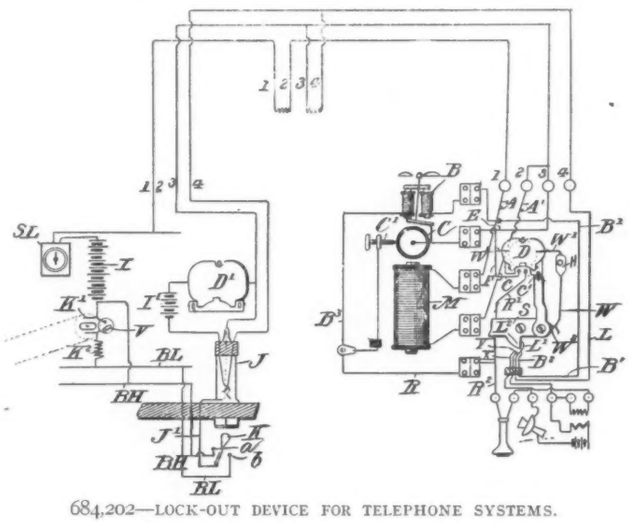
684,194—SIGNAL FOR TELEPHONE TRUNK LINES.

ply wires 3-4, one of the connections including the line signal k. All subscribers' instruments work alike, calling in by merely removing the receiver from the switchhook. In the case of C' current then flows by the following path: From main battery h at central over wire 3 to the branch office, through impedance coils l-m to the signal k through jack i-i' to station C', thence back by wire 10 to extension wire 4 and through coils m'-l' to ground through contact t4. If a local connection is desired it is made by means of plugs o-o' and their connecting cord 12-13, from which the wires 14 lead to the wires 3-4 through impedance coils p-p'. One of these branch wires includes the supervisory signal q. It will be observed that while this connection continues the lines 9-10 are disconnected from the central supply except through the wires 14, and voice currents are prevented from passing back onto the main line by the choke coils p-p', l-l', m-m'. In order to still further prevent any accidental leakage of changing currents, a condenser n is bridged across the supply circuit between the pairs of coils l-l' and m-m'.

If a connection with the main line is desired the plugs u-u' are employed, with their connecting cord 15-16, having the bridged coil w and the supervisory signal v. Such lines as are to be used for connection through the main line to central must be provided with a special spring jack i', and it is proposed to make such spring jacks of a different size from the local connecting jacks i, so that the plugs o-o' will not fit.

684,194.—H. M. Crane. Signal for Telephone Trunk Lines.

This is a system of trunk signaling where the circuits and apparatus on the subscribers' switchboard are those commonly known as the relay type, full common battery. In the drawing A represents one circuit of a subscriber's



684,202—LOCK-OUT DEVICE FOR TELEPHONE SYSTEMS.

or answering operator, B is a trunk operator's position, 1-2 being the trunk line, a the trunk jack at the calling end and b the trunk plug at the trunking end. The answering operator has supervisory signals of the usual type, as shown, while the trunk operator is provided with a ringing signal l and a disconnect signal e, the former being a red lamp and the latter white.

The operation of the system is as follows: Supposing that the answering operator at the A board receives a call for a subscriber on the B board, she connects by her cord circuit the spring jack of the calling subscriber with the spring jack of the trunk line 1-2, giving the B operator the number wanted. The B operator then completes the connection. When the answering operator inserts her plug in the jack a a circuit is thus established for the battery m through the conductor 5 at the B board, including the high resistance winding of the relay g. This relay draws up its armature closing shunt 4 about lamp e, to prevent its lighting, the shunt including relay f, which pulls up its armature and closes conductor 7. The trunk plug being inserted in the wanted jack, current flows from battery d through circuit 3-7-7-7, including lamp l and lights the same. Operator B then rings and continues to ring as long as the red lamp l is lighted. When the subscriber answers current flows from battery d out to his line through

the relay h, which closes circuit 6 through relay windings of g and i, the former being of very low resistance compared with its twin winding, and immediately permitting sufficient current to pass from battery m to energize the supervisory relay at the answering operator's station, and the relay i pulling up its armature to close shunt 8 about the red lamp l. This shunt includes a short winding on relay i, so that the armature is held permanently when once attracted.

When the subscribers finally hang up, relay h is de-energized, winding 20 of relay g is cut off and the high resistance winding cuts off so much current from battery m that the A operator's supervisory relay lets go its armature and lights its supervisory signal to disconnect. The A operator then pulls out the plug from jack a, and relay g lets go its armature, opening shunt 4 and permitting the lamp e to light on current from battery d. The trunk operator then disconnects. If the calling subscriber wishes to call back the other subscriber, the A operator signals the B operator to ring again, by merely taking out the plug and sticking it in again, when the red lamp l will at once light.

684,202.—A. Durbin. Lock-out Device for Telephone Systems.

This is a lock-out device intended to be used in connection with apparatus patented to Thomas C. Drake in February, 1898, June, 1898, and April, 1899. In Mr. Drake's systems provision is made for a number of stations on one line, individual stations being selected from central office by means of step by step mechanism worked by current impulses sent out by the operator. At each station is a rotary switch which cuts in the local circuit at only one point in its periphery, these points being differently situated at all the different stations. As shown in the diagram, which is somewhat obscure, the subscriber's station is on the right and the central office is on the left. To call any particular station the operator at central first plugs into the jack J and then works the key K or the key K′ to send impulses over the line wires 1-4. These affect the magnet M at the subscriber's station and step around the disc C until its contact point touches the pin C′, when that particular station is in circuit, and no other. On the other hand, if the subscriber wishes to call in, he finds the battery I′ connected to lines 3-4, because there is no plug in the jack. He can therefore remove his receiver from the hook and current from battery I′ will throw down the drop D′, and will also throw down another drop D at his own station, this latter drop bridging across two terminals W and W1, through which he then finds his talking circuit is complete. Of course, if some one else is using the line, a plug will be in the jack J, the battery I′ will be disconnected, and there will be no current to throw down the drop D so the subscriber will remain disconnected and locked out.

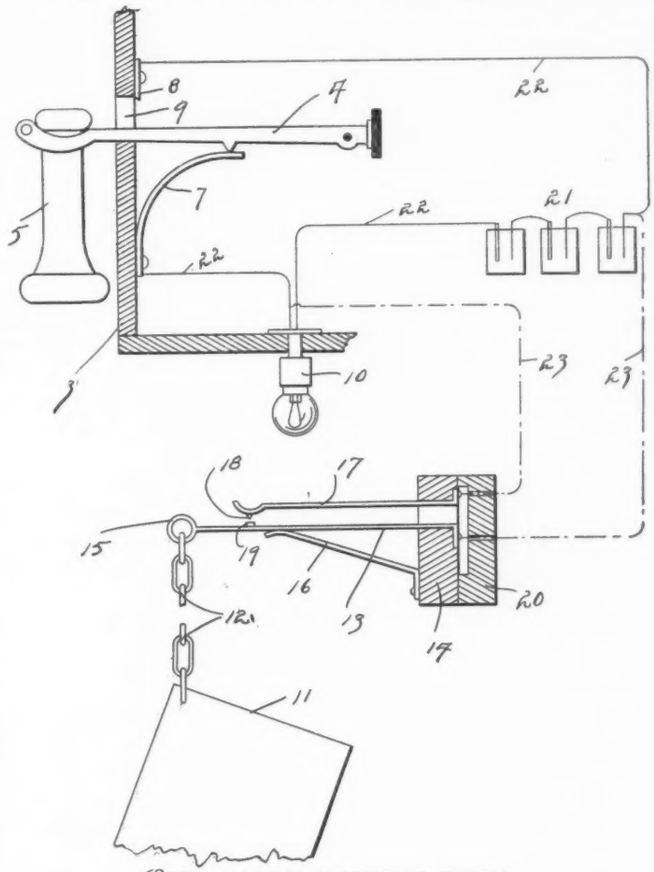
684,274.—F. E. Lister. Automatic Lighting System for Telephone Stations.

This is a scheme for lighting up a telephone booth while using the phone. The incandescent lamp 10 is in circuit both with the switchhook 4 and with a switch 17-19, upon which is hung the telephone directory 11. When a user picks up the directory the lamp lights and enables him to find his number without straining his eyes. When the switchhook goes up the light is continued.

684,289.—F. R. McBerty. Signal for Telephone Switching Systems.

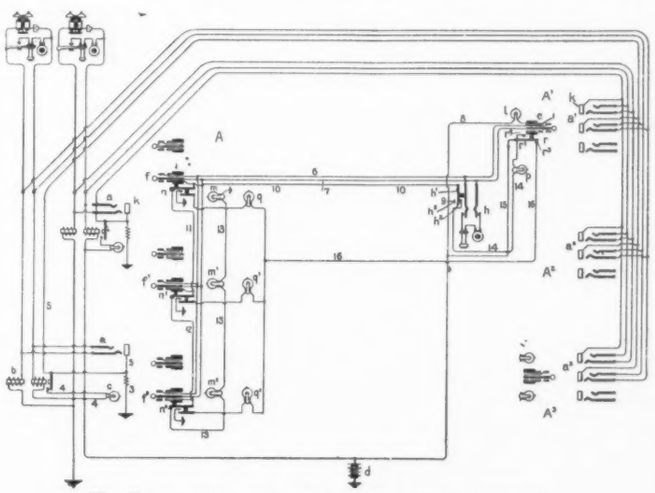
This is an improvement on a former system of the type known as transfer multiple, where all the calls from subscribers are received on one board and are trunked or transferred thence to various operators on a second board containing multiple jacks only. The answering operators thus are enabled to distribute incoming calls among the multiple or connecting operators, so as to secure uniformity. As all connecting operators have complete sets of multiples before them, any one of them can complete connections.

In the diagram 6-7 is a trunk line, multipled to plugs f, f^1, f^2 in front of the several answering operators at board A. Each plug has a clearing-out lamp q-q^1 or q^2 and a free signal m-m^1 or m^2. At the A′ board, where the connections are completed, a single plug is provided, and it has two supervisory lamps p, controlled by plug seat switch e and l, controlled by the connection or disconnection of the plug with a jack.



684,274—AUTOMATIC LIGHTING SYSTEM.

If one of the subscribers on the left calls his lamp c lights. Whenever a trunk or connecting operator is not busy she turns down her listening key h and the result is to close circuit from battery d back through wire 10 to and through plug seats n-n^1 and n^2 and through lamps m^2-m^1-m to ground. These lamps light and show that the



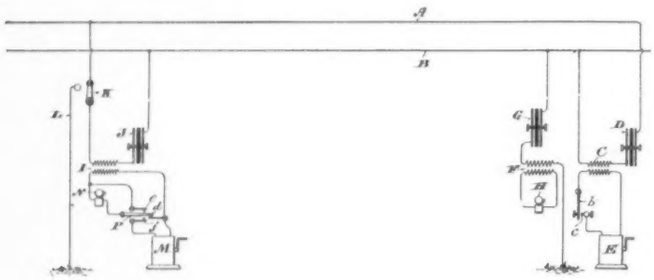
684,289—SIGNAL FOR TELEPHONE SIGNAL SYSTEM.

girl and the trunk are "free." The answering operator, seeing the subscriber's call mentioned, picks up plug f and answers the call with it. The lamps m-m¹-m² are at once cut off, but lamp q lights, current flowing from battery d by part 15-r¹-r³, 16-q and ground. Operator at A' being already connected, then gets the number and lifts plug e to complete the connection. This first puts out lamp q, then lights lamp l, which is brought into connection with the jack sleeve, and in parallel with line lamp, whose circuit is open, as the subscriber has not answered.

When subscriber answers, the line lamp circuit is completed and the current from battery d divides and both lamps remain extinguished. Lamp p is in parallel with the line lamp of the calling line and responds to movements of the calling subscriber, so l and p are really supervisories. In clearing out, the plug e is first removed, which lights lamp q again until plug f is put back in its seat.

684,303.—W. E. Pembleton. Electric Telephone System.

A bridging bell system, wherein "resonators" are bridged with induction coils, the generators and ringers

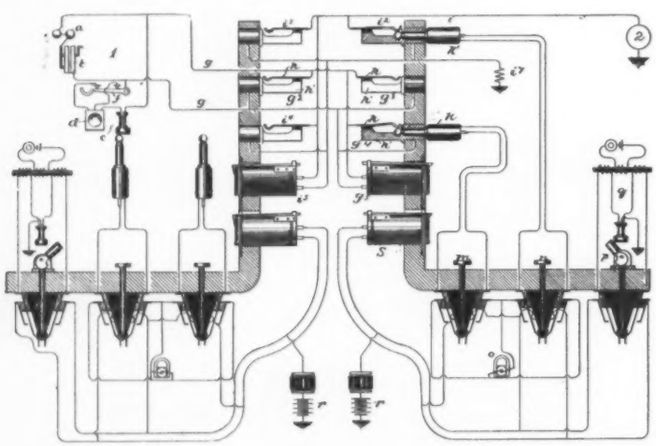


684,303—ELECTRIC TELEPHONE SYSTEM.

being all in local circuits. Central at E rings out over metallic, and stations as M ring in over ground, with switch K to change from ground for sending to metallic for receiving.

684,315.—C. E. Scribner. Multiple Switchboard System.

This is a very interesting case. The application was filed October 19, 1891, and it covers an old-fashioned magneto system, but with a two-wire multiple. In order to dispose of the annunciator problem, a low resistance, high impedance, clearing-out coil was permanently bridged across each cord, the line signals also being permanently bridged. The result is that clearing-out current coming in to central finds a path through the clearing-out bridge by preference, the high wound line signals being unaffected. The bells at subscribers' stations are also low wound and shunt the line signals in signaling out. Thus the line signals can be left permanently bridged and a spring and

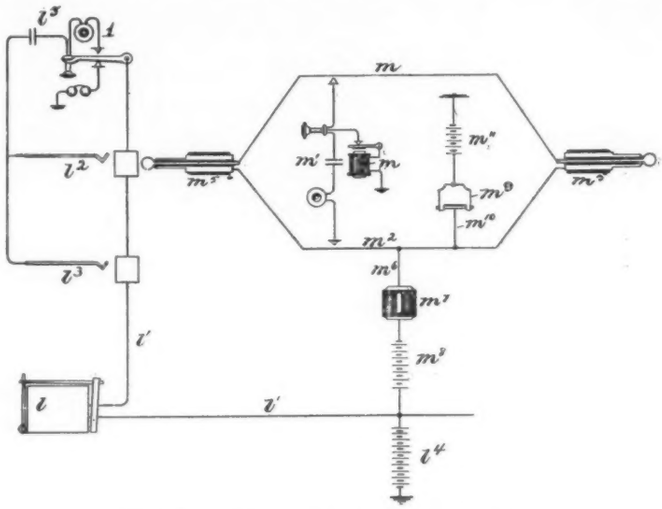


684,315—MULTIPLE SWITCHBOARD SYSTEM.

sleeve jack is the result. The claims are broad and the patent is doubtless controlling so far as it goes.

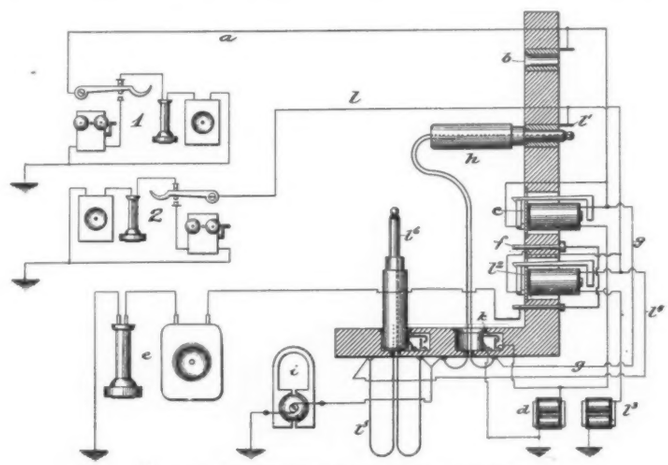
684,316.—C. E. Scribner. Multiple Switchboard System.

This is another old case, filed February 11, 1892, the system being of a closed circuit type, where main battery l⁴ constantly sends currents to lines to hold up annunciators l and subscribers' bells are in a ground. A subscriber calls



684,316—MULTIPLE SWITCHBOARD SYSTEM.

by removing his receiver, cutting off his ground, when his line drop falls. The operator plugs in and restores drop manually. Current from battery m⁸ then flowing in local circuit m⁶-m²-l¹ to retain line drop. The clearing-out drop m⁹ is in a ground tap from sleeve strand of cord, with separate battery, and is energized when the subscribers hang up. A vibrating circuit breaker m, so constructed that it buzzes for a few seconds and then comes to rest, is connected to operator set. If a line tested is idle current from l⁴ through the line annunciator is insufficient to work it. If a plug is already inserted and line in use, current from l⁴ comes through the ether cord and buzzes the vibrator m.



684,317—TELEPHONE EXCHANGE APPARATUS.

684,317.—C. E. Scribner. Telephone Exchange Apparatus.

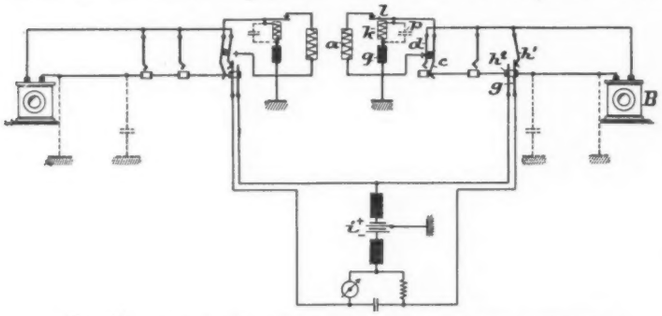
This is another old case, having been filed March 24, 1890. It covers a grounded system, each line having a single contact jack as b at central, and continuing from the jack through a line annunciator c to a terminal plug h, and in parellel therewith to an impedance coil d and ground. The plug has two contacts, a tip and sleeve, the sleeve being connected to line and the tip to an alternating current generator i. In making a connection subscriber one calls in with his direct current generator, energizing the line magnet c and throwing down the drop. The operator picks up the plug h and applies the tip to the jack of the line wanted, having previously ascertained the number by

means of a connection with her head set formed by the drop shutter falling on the pin f. When the tip of the plug is applied to a jack generator flows out over that line to ring the wanted subscriber's bell. This current does not affect the line annunciator, because of the impedance coil connected between it and the ground, which will pass direct current, but chocks back high frequency alternating currents.

Each plug has a switch k in its seat which shunts the impedance d during a connection, so that one of the line annunciators will serve for clearing out.

684,366.—G. Grabe and L. Polinkowsky. Telephone Exchange Apparatus and Circuits.

The whole point in the present case lies in means to cut off the line signal when an operator plugs into a multiple jack. There are several ways shown for doing this, the first one being illustrated herewith. A and B are subscribers' stations connected by central office plugs and cords. The subscriber A called and the answering plug was inserted in his answering jack, which is a cut-off jack. The

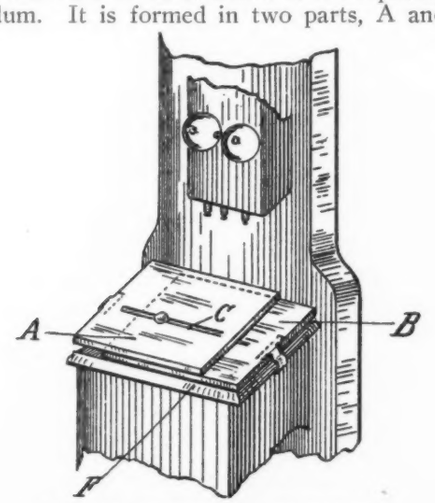


684,366—TELEPHONE EXCHANGE APPARATUS AND CIRCUITS.

calling plug g was inserted in a multiple jack of the line of subscriber B and the line signal a is at once cut off by means of a relay k which receives current from the battery i in the cord circuit. The patentee describes several ways of preventing the relays a and k from responding to the wrong currents. The signal a is of high resistance and has small self-induction, hence responds readily to alternating current from station B, which is prevented from passing through the relay q by the impedance coil g and the condenser shunt p. On the other hand relay k responds to the direct current from battery i, which does not affect the signal on account of its high resistance. Another way of effecting this is to polarize the respective magnets oppositely.

684,445.—H. J. Myer. Telephone Attachment.

This is a slate to be attached to a telephone desk for memorandum. It is formed in two parts, A and B, with

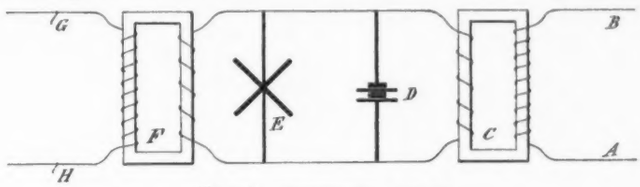


684,445—TELEPHONE ATTACHMENT.

slots C, and clips at their opposite edges so that they can be secured to desks of different widths.

684,506.—B. Gati. Telephone Relay.

This is an arc lamp used as a relay. A-B is one telephone circuit connected to one winding of a transformer C, the other winding of which is connected to a similar winding on a transformer F, whose secondary winding is

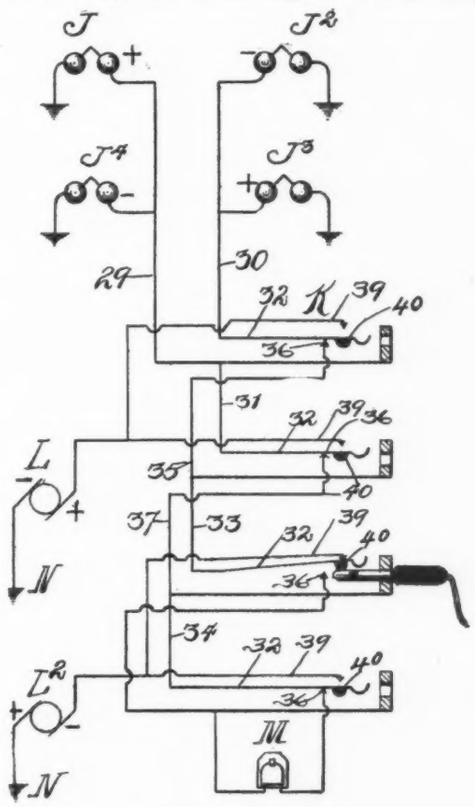


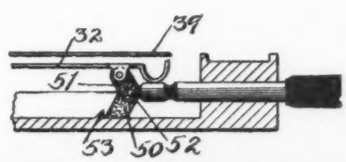
684,506—TELEPHONE RELAY.

connected to a telephone circuit G-H. Across the local circuits between the transformers an arc lamp E and a generator D are bridged. The arc lamp is preferable of continuous current type taking from 3 to 10 amperes at 45 volts and the generator supplies the normal arc. Telephone currents in line A-B are repeated into the local circuits and act upon the arc, which causes sufficient motion in the carbon, corresponding to the variation, to considerably augment the latter, which are then propagated with increased amplitude into the circuit G-H.

684,601.—F. B. Cook. Telephone Apparatus and System.

This patent apparently covers two inventions. One is shown in the diagram, consisting of a selected party line

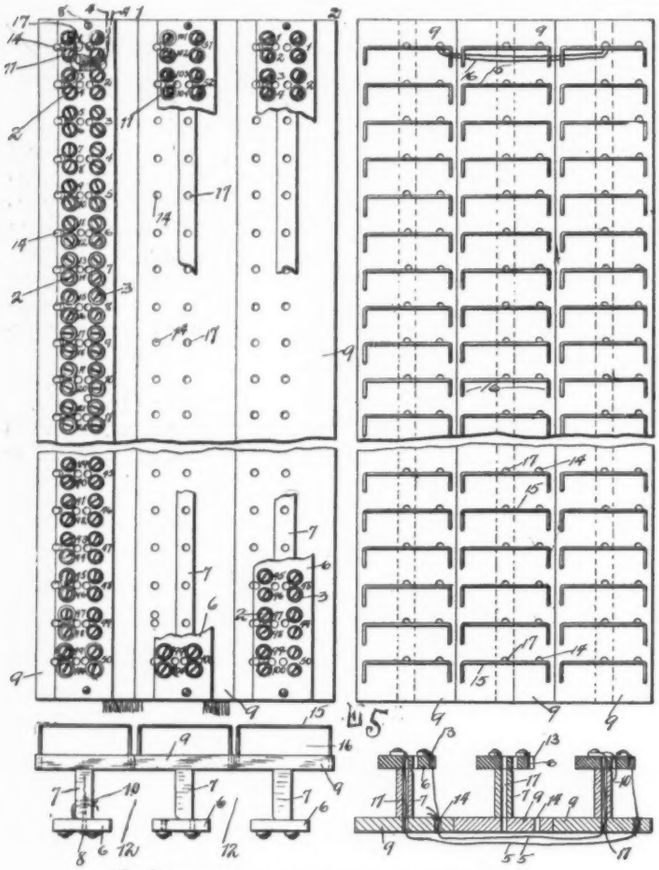




684,601—TELEPHONE APPARATUS AND SYSTEM.

system. 29-30 is the line, having four stations, J, J2, J3 and J4, at each of which the signal bell alone is shown, the

talking set being omitted for clearness, but adapted to be bridged across the line. Each of the four stations is grounded and requires current of a given polarity to ring its bell. At the central office the line is carried through four spring jacks, the arrangement of springs being such that when a plug is inserted in any one jack a calling generator can be automatically put on the line in the proper relation to ring up the corresponding station. Thus when a plug is

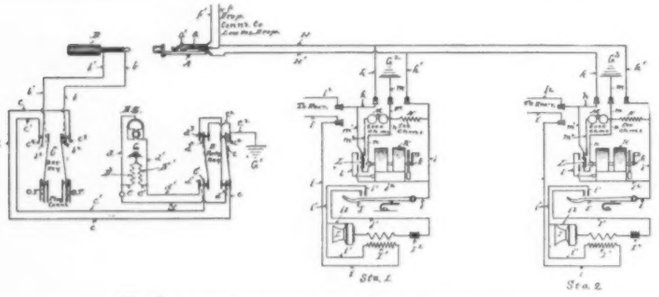


684,602—APPARATUS FOR TELEPHONE SYSTEMS.

inserted as shown, current will flow from generator L, to the spring 39, spring 32, by wire 33 and contact 36 to spring 40 and by line wire 30 to the stations connected to that side, but will ring only the bell J2, being of that polarity.

The lower part of the figure shows mechanical details of the jack. A toggle joint is employed, which raises the spring 32 against the spring 39 when the plug is pushed completely into the jack.

The second invention covers a roller attachment for the



684,615—TELEPHONE CALL BELL APPARATUS.

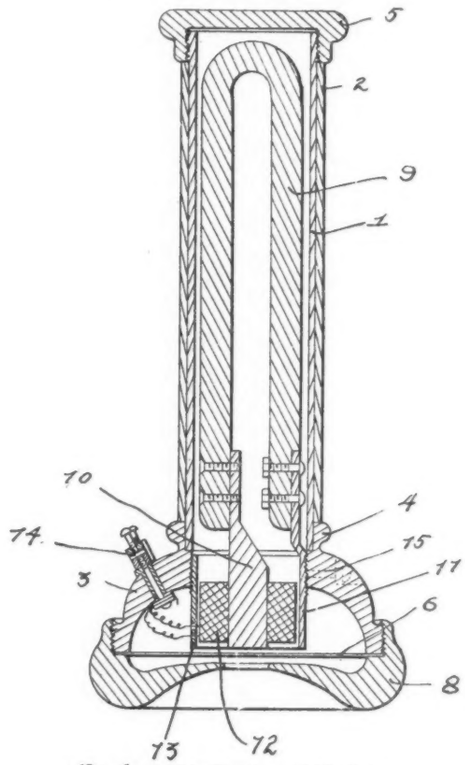
shaft of a generator, which is rolled up against the short circuiting spring when the shaft is rotated, to connect the machine to line.

684,602.—F. B. Cook.—Apparatus for Telephone Systems.

This is a cross connecting and distributing board, made in units to carry one hundred pairs of incoming line terminals and one hundred pairs of switchboard terminals each, the former being numbered 2 and the latter 3. As shown in the figure, each vertical unit has a facing strip 6 carrying the terminals, a supporting strip 7 at right angles thereto and a backing strip 9. The incoming line wires are brought up from the bottom in the spaces 12, and the pairs taken off and led through holes 10 to the front of the strips 6 where they are connected to the line terminals 2. The switchboard cables are brought down from the top in the spaces 12, and are taken through holes to the terminals 3. The jumper wires or bridle wires are taken straight back through holes in the facing strip and supporting strips, and are laid across the rear face of the strips 9 in racks 15 provided for them.

684,615.—W. S. Paca. Telephone Call Bell Apparatus.

This is a two party line selective system. The bell M, at station number one is in a ground tap from one side of the line, H: While the bell M at station number two is in a similar ground tap from the other side of the line, H'. The



684,963—TELEPHONE INSTRUMENT.

generators are bridged when ringing in, and in order that each generator may ring its own bell a shunt N is included from each bell to the other side of the line. This balances the line also. At the central office G is the generator ringing from ground to either side of the line, as it may be put on by the party key D and the regular key C.

684,963.—W. W. Washburn. Telephone Instruments.

This is a receiver having one pole of its horse shoe magnet tubular to surround the coil on the other pole, and screw threaded on the outside to take into a metal cup 3 which is carried on the end of a metal tube 1, and itself carries the cap 8.

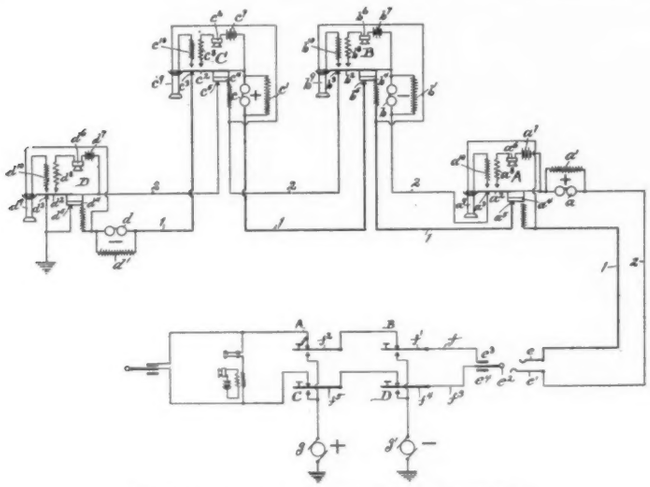
685,034.—W. W. Dean. Party Line Telephone System.

It is now quite common to use four party selective signal lines, the bells at the four substations being in ground taps from opposite sides of the lines, and the two bells connected to the same side of line requiring current of opposite polarities to ring them. The disadvantages of having constant grounds on a metallic circuit are obvious, and Mr. Dean seeks to avoid these by putting his ground clear at the end of the line 1-2, instead of having separate ground taps, and then puts all his bells a b c d in series in the line,

and around each bell provides a shunt containing non-inductive resistance a' b' c' d'. When any subscriber takes his telephone off the hook for use he bridges his talking set and cuts off the line beyond, thereby removing the ground. At the central office keys A B C D are shown for cutting in generators on the two sides of the line and of the proper polarity.

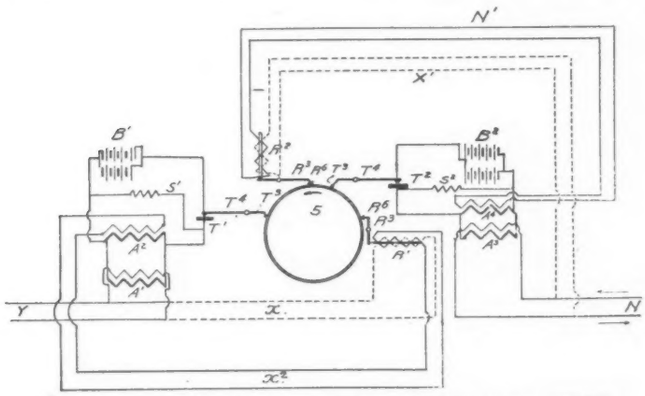
685,239.—H. A. Rhodes. Apparatus for Recording and Repeating Telephonic Speech.

This is a phonograph used as a telephonic relay or repeater. There are two graving and two reproducing



685,034—PARTY LINE TELEPHONE SYSTEM.

styluses, one pair for each of the incoming circuits. Speech currents arriving by circuit y passed to the recorder R' by dotted circuit x, and the record produced by this recorder



685,239—FOR RECORDING AND REPEATING TELEPHONIC SPEECH.

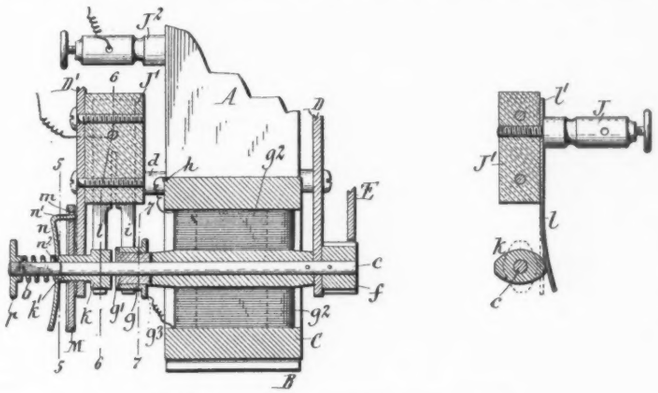
on the cylinder 5 is reproduced through the stylus T3, affecting the transmitter T2 in local circuit with battery B2 so as to repeat into circuit N through the induction coil A3, A4. Currents arriving by circuits N pass to the recorder R2, and are repeated by the stylus T3 and transmitter T' through coil A' A2 into circuit Y. To prevent repetition back into the same circuit shunts S' S2 are provided across the local circuits, together with differential windings on the recorders connected to the primary circuits of the induction coils.

685,286.—J. S. Mead. Magneto Electric Generator.

This is a magneto generator fitted with a make and break device to give impulses of considerable intensity. The device consists of a cam k fastened to the shaft and adapted to touch a spring 1 as it turns. While touching the spring the armature is short circuited, and as the cam revolves this short circuit is broken twice in each revolution, producing a current of considerable intensity and sharp reversals.

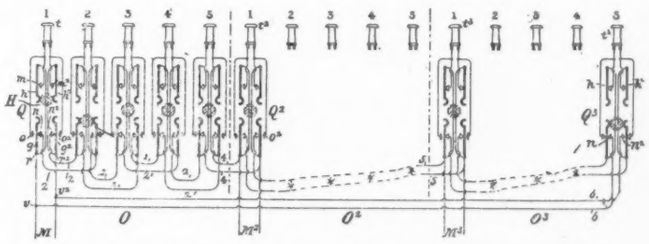
685,401.—A. S. Hibbard. Universal Call Circuit and Apparatus for Toll Service.

This invention is intended to simplify the operator's labors in toll service and to effect a saving in time over the system now employed, whereby tickets are made out in every case of toll connections, these tickets passing through the hands of several operators successively before a toll connection is completed. The idea involved is similar to that of having a string of cabs on a stand and moving the line up every time a cab is engaged and drives away. Orders are communicated direct and executed at first hand.



685,286—MAGNETO ELECTRIC GENERATOR.

Suppose toll lines come into the toll board from outside exchanges and other portions of a local exchange. These would usually be accompanied by instruction circuits M-M2-M3. Each of these is provided with a group of operators as O-O 2-03. These operators are provided with three position switches. In the middle position, as shown at number one of group 02, the number one operator is connected to the circuit M2, and all the other operators are in line on the same circuit, as well as on their own circuit M, and in fact all the fifteen operators are in line on the three doorways waiting for calls. When an operator gets the first call for a toll connection she drops out of line by throwing over her switch to the position shown at



685,401—CALL CIRCUIT AND APPARATUS FOR TOLL SERVICE.

H in group O, and goes on to the return order circuit to select the trunk and get the number wanted. Having received the information, she makes out the ticket and performs all the operation herself of completing the connection. Having finished this, she drops back into line and waits for her turn again. By throwing the switch down as at 2 in group O the succeeding operators are thrown out and number two gets control of the order circuit M.

Plans are now under way to install telephone instruments on all trains running across the state of Colorado. At all large stations sockets and switches will be located so that when trains stop one of the crew will instantly connect the train system with the Denver exchange, and through it to the long-distance circuits. Connecting switches will be placed at Denver, Greeley, Boulder, Palmer Lake, Colorado Springs, Pueblo, Salida, Alamosa, Durango, Grand Junction, Florence, Cripple Creek and Victor.

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THE CARTY PATENT DECISION.

On January 27 Judges Buffington and Acheson, in the United States Circuit Court, for the eastern district of Pennsylvania, held the Carty bridging bell patents to be invalid. The suit was an injunction proceeding brought against the Anthracite Telephone Company of Hazleton, Pa., by the Western Electric Company. The injunction was refused and the costs were placed upon the plaintiff. The case is in many respects remarkable; the judgment is a reversal, by themselves, of the opinion held by the two judges in a former case of the Western Electric Company against the Millheim Electric Telephone Company. The same judges decided at that time in favor of the Carty patents, their judgment being confirmed by the Circuit Court of Appeals. In his opinion refusing the injunction and placing the costs on the Western Electric Company, Judge Buffington says that he and the United States Court of Appeals would have dismissed the former case had they known that the American Telephone & Telegraph Company, as since developed, owning more than one-half of the stock of the Western Electric Company, bought out the Millheim company, pending the decision.

Judge Buffington, in his opinion, declares that the devices covered in the Carty patents involve no patentable novelty, because the general principles applicable to series and multiple-arc distribution were known and used prior to Carty's invention. The case was argued by Mr. F. P. Fish and George P. Barton for the Western Electric Company and R. S. Taylor and Charles C. Bulkley for the Anthracite Telephone Company.

The decision is a signal Independent victory. The Carty patent was the last hope of the Bell company, and the telephone field is now open to all. As in the Berliner decision, this finding of the court leaves no valid ground for an appeal, so it is safe to say that telephone patent litigation is a thing of the past.

A CHICAGO CONVENTION IN APRIL.

The Chicago telephone manufacturers, supply men and other kindred interests announce that a banquet will be tendered to Independent telephone exchange representatives from Illinois and adjoining states on April 9. It is the intention to hold a western convention in Chicago on April 9, 10 and 11, and the banquet is only one of the features. At this time the Illinois Independent Telephone Association will also convene in Chicago, and as the officers of that association are on the committee for entertainment of visitors, all interests will be amply cared for. For some time the necessity of an Interstate or Central States Telephone Association has been apparent, and a large number of exchange owners are strongly in favor of such an organization. This matter having come to the attention of the manufacturers and dealers in telephone apparatus and auxiliary supplies, they decided at a joint meeting, held at the Palmer House, Chicago, January 16, that on the occasion of this gathering they would provide entertainment for the visitors during their stay in Chicago. Invitations will be sent out to about seven thousand telephone men, and a large attendance is expected. The convention will be held at the Sherman House. The entire program will be published in the March TELEPHONY.

EVERETT-MOORE AFFAIRS.

The affairs of the Everett-Moore syndicate have cleared up somewhat and it is reasonably safe to assume that everything will come out in a satisfactory manner. As soon as the report of the committee of bankers and engineers, who are examining the affairs of the company, is issued, it will be published in this journal. The erroneous statement has been made that the present embarrassment of the syndicate was due in most part to its telephone properties. While this publication does not believe in combinations or consolidations, it seems only fair to the company to say that its telephone properties were earning good dividends. Federal telephone, which represents the most expensive construction, being located in the rocky, hilly portions of western Pennsylvania and eastern Ohio, earned a net surplus of $13,289.96 for the month of December, after providing for interest on bonds, operating expenses, general expenses, insurance, taxes, maintenance, etc. This is equivalent on an annual basis to a net earning power of $159,478.32 a year; so that, taken as a whole, Federal telephone interests are not alone paying all charges, but are earning a very substantial profit available for dividends on the stock. This satisfactory result has been accomplished with several exchanges undergoing a process of construction and not yet completed. The company's other telephone properties, we understand, are in as good condition. There are rumors to the effect that the Morse syndicate, owning the Telephone,

Telegraph & Cable Company, is trying to purchase the Everett-Moore telephone properties; also that Wall street capitalists are trying to buy the interests. None of these rumors can be confirmed, however. The outcome of the affair will be watched with interest. The general opinion expressed is that the affairs of the syndicate will be adjusted in a satisfactory manner to everyone concerned.

WISCONSIN INDEPENDENT TELEPHONE CONVENTION.

The Independent Telephone Association of Wisconsin will hold its annual convention on February 19-20, at the Hotel Pfister, Milwaukee. This meeting will be of unusual interest and a large attendance is expected. The program for the two days' session has been prepared with a view to covering a wide range of telephone subjects of importance. It is understood that a large number of telephone manufacturers and supply men will make exhibits of their product. In the notice sent out by the secretary of the association he says:

One of the objects of the meeting is to devise some plan for projecting some copper long-distance trunk lines through the state of Wisconsin. It is expected that the meeting will materially assist in securing an independent telephone franchise in the city of Milwaukee, as several franchises are now pending in that city. The convention headquarters will be at the Hotel Pfister, and the sessions will be held in the hotel convention hall. The past year has been a most prosperous one for the Independent companies of Wisconsin, and the indications point to a well-attended and successful meeting. Remember the date, February 19 and 20, at Milwaukee.

The officers and executive committee of the association are as follows: A. I. Hutchinson, president, Weyauwega; C. H. Schweizer, vice-president, La Crosse; H. C. Winter, secretary and treasurer, Madison; Richard Valentine, Janesville; F. H. Sweet, Fond du Lac; J. C. Harper, Madison; W. J. Bell, Baraboo; J. A. Gaynor, Grand Rapids; W. F. Gumaer, Appleton; Emil Maurer, Arcadia; H. H. Stewart, West Superior.

CHICAGO TELEPHONE COMPANY MATTERS.

Attorney Levy Mayer, who is about to push the case against the Chicago Telephone Company, declared that the statute of limitations would not, in all probability, prevent the forcing of the company to refund the $3,000,000 of excess charges it has obtained during the last ten years. He already has drafted the papers for the opening of the suit to recover this money.

"The Manufacturers' Association has asked for and received from us an opinion on the question whether the $50 excess charge exacted in the past by the Chicago Telephone Company from its business subscribers and the excess of $25 from residence subscribers can be recovered," said Mr. Mayer. "We think Judge Tuley's opinion covered the question when he said: 'The law does not require objection to be made to the payment of unjust charges for the reason that it would be in vain, being addressed to those who occupy the commanding power to force obedience to their requirements."

Further than this Attorney Mayer would not give his opinion, which has been received by the association and which will form the basis for the new suit. Mr. Mayer and Secretary J. M. Glenn of the association conferred and arranged for the details of the case. When the suit will be filed neither would say, but both acknowledged that it will be soon.

Notices have been sent to all the members of the association to send in all their data on the excess charges of the company. The papers for the suit are ready, save the insertion of the amount to be demanded back.

After the conference Secretary Glenn made the following statement:

"As soon as Mr. Mayer got back from New York we went into conference with him on the latest phase of the telephone question. The Manufacturers' Association is not satisfied with the victory already secured in the litigation before Judge Tuley. It will not rest content with the injunction which prohibits the telephone company from collecting in the future $175 for a trunk line telephone.

"Judge Tuley's decision applies to all who are parties to the litigation, and the decision expressly provides that all others similarly situated may intervene and get the benefit of the injunction. The ordinance was passed on January 4, 1889. More than twelve years have passed and only eight years still remain. It was a great accomplishment, I admit, to prevent the company from collecting an excess of $50 during the coming eight years. It will be even a greater achievement to make the company refund what it has collected illegally since it raised the price to $175 in 1893.

"We are now collecting the statistics, and at the lowest estimate the company has collected an excess of $50 a year for nearly ten years on an average from a least 5,000 business subscribers, or $250,000 a year. That is not all. For years the company charged residence subscribers $125 a year. This was $25 in excess of the maximum rate in the ordinance."

It looks as though the Chicago Telephone Company might have to give up a share of its dividends to its long-suffering subscribers.

THE TELEPHONE.

It is hardly possible to realize that only twenty-five years ago the telephone was hardly more than the dream of two or three imaginative scientists, and that it was not until at least a decade later that this means of communication began to play an important part in the daily life of a considerable fraction of the earth's inhabitants. There are still not a few million human beings who have never used or even heard of a telephone, but they are the millions who count for little except in their own somewhat mistaken estimations. For all the really active and effectual part of humanity the telephone has come to be something not much different from a necessity of life. Social and commercial activities have so adjusted themselves to the machine which gives indefinite extension to ear and tongue that were the facility, not long ago unthought of, to be suddenly withdrawn, the most serious embarrassments would follow. The efficiency of every business man would be so materially decreased that for a while at least there would be grave trouble and confusion. Yet people have already come to use the telephone without a thought of what a marvelous thing it is, and we hear vastly more about the cost and imperfections of the service than about the numberless and inestimable advantages derived from it.

NEW YORK'S TELEPHONE SCHOOL.

New York's first telephone school has now been opened in the Eighteenth Street exchange, at Eighteenth street and Irving place. Rooms on the third floor have been devoted to this purpose, and hereafter all applicants will be put through a three months' course of study.

Heretofore the novice was sent to the Cortlandt Street exchange, which has the largest switchboard in the world, and placed beside an operator to gain what knowledge she could between calls.

Now all will be different. From nine to five, lectures on the theory, illustrated by charts showing the position of the various keys, will preface the actual practice on the switchboard in the room adjoining. This is so arranged that short and long distance calls may be tried and absolute tests made of the pupils' accuracy. Maps of Manhattan, Brooklyn, Staten Island and New Jersey will also be studied by telephone districts.

The hello girls will be paid while under tuition, and for their lunches will share the big lunch room of the exchange with the regular employes.

DECISIONS AFFECTING TELEPHONY.

PREPARED FOR TELEPHONY BY ANDREWS & MURDOCH, BERRIEN SPRINGS, MICH.

PRIORITY OF OCCUPATION OF STREETS.

The Cumberland Telephone and Telegraph Company constructed its line in the streets of Louisville under a franchise granted therefor which expressly reserved the right of the city to grant similar rights to other companies. Thereafter a franchise was granted to the Louisville Home Telephone Company, which was required to construct its line under the directions of the board of public works, and such board required its line on certain streets to be placed on the same side and over the same space occupied by the first company. The poles were planted in line with the first company, but were extended twenty-five feet higher, with the cross-arms twenty feet above those of the old line.

The old company secured a temporary injunction in the United States Circuit Court for the Western District of Kentucky restraining the new company from erecting or maintaining telephone poles and wires along its side of certain streets. This injunction has just been dissolved by the Circuit Court of Appeals (111 Fed. Rep. 663), which holds:

While the prior occupancy by a telephone company of a space in a street for its poles and wires under a franchise granted for such purpose will entitle it to continued enjoyment thereof, without substantial impairment, so long as it continues to perform its obligations, its right to such space is not absolutely exclusive, but is subject to the right of another company to enjoy a like privilege therein granted under power reserved by the municipality, provided there is no unreasonable or unnecessary interference with the operation of its own line, and it will suffer no serious injury therefrom, and in the case before the court there was no such substantial interference with the rights of the first company, or serious injury threatened to the operation of its line, as entitled it to a preliminary injunction to prevent the placing of wires on the poles of the second company and their use pending the trial of a suit for a permanent injunction.

TELEPHONE POLE IN HIGHWAY.

The supervisors of Amherst County, Virginia, purchased a strip of land along an old road near Lynchburg for the purpose of highway, but the location of the old road was not altered in the manner prescribed by statute, but continued to be used more than the new road. By consent of a supervisor the Southern Bell Telephone and Telegraph Company placed one of its poles in the center of the old road. While J. Ashby Watts was returning to his home one dark night from attending an opera in Lynchburg, the shaft or hub of his vehicle came in contact with this telephone pole. This collision frightened the horse, which became unmanageable and ran away, causing the vehicle to collide with another telephone pole of the defendant on the margin of the highway further on. The result was that Watts was thrown violently from the vehicle and his ankle broken.

In an action against the telephone company in the Circuit Court of Amherst County for damages due to its negligence a judgment was rendered in favor of the company. This has just been reversed by the Virginia Court of Appeals (40 S. E. Rep. 107), which holds:

The pole in the middle of the road was the proximate cause of the injury. There was no such discontinuance of the old road as will exempt a telephone company from liability for injuries caused to a traveler by one of its poles set in the middle of the old road. The supervisor had no authority to authorize the placing of the pole in such a manner.

RIGHT TO QUESTION FRANCHISE.

The city of Chattanooga, Tenn., by ordinance granted to T. S. Wilcox and associates the right to establish an electrical plant in that city; to put up and maintain a telephone, telegraph and electrical exchange; to erect poles, wires, cables and all necessary devices, appliances and constructions, including the privilege of constructing underground conduits and erecting, running and maintaining underground wires; together with all necessary devices and appliances for the conduct of a general telephone, telegraph and electrical plant.

Z. C. Patten and eighteen other citizens of Chattanooga, purporting to be for themselves and all other taxpayers, voters and property owners thereof, instituted an action against the mayor and aldermen to have the ordinance declared void.

The Court of Chancery Appeals affirmed a decree of the Chancellor declaring the ordinance void, but this decree has been reversed by the Supreme Court (65 S. W. Rep. 414) in an opinion which holds as follows:

1. Where a bill brought by private citizens to have a city ordinance granting a telegraph, telephone and electrical exchange franchise decreed void does not show that complainant will suffer any injury not common to the body of the citizens, they have no such interest in the subject matter as gives them a status to call on the court to determine the validity of the ordinance.

2. Where a city ordinance grants an exclusive franchise to construct and operate a telegraph, telephone and electrical exchange in the city, the validity of such exclusive grant, and authority of the city to grant such exclusive right, can be called in question only by one claiming the right to do something contrary to such exclusive feature.

3. The validity of an ordinance granting the right to construct and operate telegraph and telephone lines along the streets of a city is not affected by the fact that the exercise of such right may impose an additional burden on the fee of the streets, as if such burden is imposed, the persons exercising the franchise may be required to pay damages therefor.

COMPELLING TRUSTEES TO ACT ON AN APPLICATION FOR FRANCHISE.

The village trustees of Monticello, New York, were averse to permitting the Monticello Telephone Company to use its streets for the erection of poles and delayed passage of an ordinance regulating such erection and the stringing of its wires by the telephone company. The company, to compel the trustees to take action, instituted mandamus proceedings against the board. In considering the application the Supreme Court said: "The laws defining the rights of telephone companies and the powers of the boards of trustees of villages seem reasonably clear. The transportation corporations law gives to telephone companies the right to erect, construct, and maintain the necessary fixtures for their lines upon any of the public roads, streets and highways within the state. And this has been held to be a franchise directly from the legislature to the corporation to use the public streets for constructing and maintaining its lines. But, notwithstanding this, the village law confers upon boards of trustees of villages power 'to regulate the erection of telegraph, telephone or electric poles, or the stringing of wires in, over or upon any of the streets or public grounds.' This is a power involving discretion upon the part of the board of trustees, and the exercise of this discretion cannot be controlled by mandamus. While the courts can compel the exercise of the power, the particular method of its exercise cannot be controlled by mandamus. Manifestly, neither the court nor the board of trustees of the village has any right to grant the request of this company to string its wires upon poles belonging to other companies, as appears by the application filed by the company with the board of trustees it has requested the privilege of doing. It appears very clearly here by the papers used on this application that the board of trustees have sought to either prohibit entirely or to embarrass the telephone company very mater-

ially in its rights to use the streets for the purposes of its company, and have delayed passing any regulations for that purpose a long time. It was not unreasonable, however, for the trustees to require the filing with them of a map by the telephone company showing where it desired to locate its lines and poles before passing an ordinance regulating their erection." The court denied the motion, but granted leave for a renewal of the application if the passage of the ordinance should be unduly delayed.

TELEPHONY'S OHIO MANAGER.

In this issue is presented the portrait of Mr. S. C. Crofford, TELEPHONY'S Ohio manager, who has opened a suite

S. C. CROFFORD.

of offices in the Williamson building, Cleveland, from whence he will look after the interests of this publication throughout the state. Mr. Crofford will also represent Messrs. J. Manz & Co. of Chicago, one of the largest engraving and printing houses in the world. Mr. Crofford will extend every courtesy to visiting telephone men.

RUNNING TRAINS BY TELEPHONES.

The announcement that telephones are to supplant the telegraph in the operation of trains on the Illinois Central will be received with much satisfaction by those who believe the telephone is to supplant the telegraph.

Telephones are already extensively used by many railway systems as auxiliary to the telegraph in handling trains, but to completely substitute telephones for telegraph and to abandon the written messages altogether in operating trains over 5,000 miles of trackage presents a radical departure in railroading, the results of which will be watched with great interest.

There is no doubt about the practicability of transmitting train orders by telephone, and there is little doubt that the method of transmission would be more expeditious than the telegraph key. The human voice can speak the message much more quickly than it can be recorded in dots and dashes.

But can the human voice be always as reliable as the Morse instrument? Isn't it possible that the man at the other end will sometimes fail to catch every word and every syllable of a train order? How about locating responsibility for mistakes?

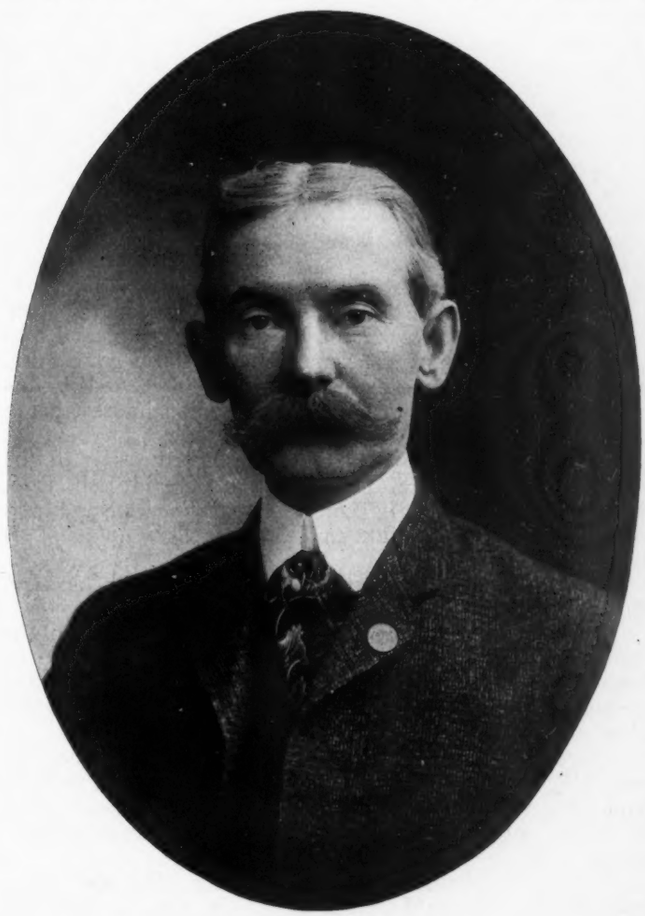
These are questions that occur to those who have learned the value of written orders or messages in other departments of industrial activity. It is possible that they may be satisfactorily answered by the railway experts who have made experiments in train-dispatching by telephone. The public concern is in the safety and accuracy of the system as well as its rapidity.

MR. J. J. NATE.

Mr. J. J. Nate, formerly general superintendent of the Standard Telephone & Electric Company of Madison, Wis., has resigned from that company to accept a prominent position with the Stromberg-Carlson Telephone Manufacturing Company, Chicago. In speaking of the change, Mr. Nate said:

'The rapidly growing telephone interests throughout the country convinced me some time ago that my proper sphere of action lay in Chicago, and it was not until quite recently that I determined to make a change. I have gained my experience through twenty-five years' service for both the Independent and Bell companies, and knowing Chicago was the telephone center, decided it was best to locate there."

The Stromberg-Carlson Telephone Manufacturing Company is one of the largest and strongest concerns of



J. J. NATE.

its kind in the Independent telephone field, and it was particularly fortunate in securing the services of Mr. Nate, who is peculiarly fitted for the position he assumes.

THE CARTY PATENT CASE.

The full text of the opinion handed down by Judges Acheson and Buffington of the Western Circuit Court of the United States for the Western District of Pennsylvania in the now celebrated "Carty" case is given herewith in full The decision was rendered on January 27 and is a sweeping victory for the Independents. This patent (?) was the last prop of the erstwhile monopoly. The field is now open and it is a survival of the fittest:

Western Electric Company against the Anthracite Telephony Company et al.—No. 1, June term, 1899.—In the Circuit Court of the United States, Western District of Pennsylvania. Before Acheson, Circuit, and Buffington, District, judges.

Buffington, J.—

This is a bill filed by the Western Electric Company against the Anthracite Telephone Company et al., charging infringement of letters patent No. 449,106, now owned by complainant, applied for August 16, 1890, and granted March 31, 1891, to John J. Carty, for telephone circuit and apparatus. This patent has heretofore been considered by the courts of this circuit. In the case of the Western Electric Company against the Millheim Electric Telephone Company, reported in 88 Fed. Rep., 505, the patent was held valid in an opinion delivered by Buffington, J. This decree was affirmed by the Circuit Court of Appeals, in an opinion reported in 95 Fed. Rep., 152, delivered by Kirkpatrick, J., the remaining members of the court, Acheson and Dallas, JJ., concurring. Later, the present bill was filed, and a preliminary injunction on the adjudged patents sought against the respondents. On hearing such motion, Judge Acheson refused a preliminary injunction, in an opinion found at 100 Fed. Rep., 301. In addition to other grounds thereto moving the court, including the fact that in the Millheim case the court had not been required to, and had not, in fact, passed upon or defined the scope of the claims. It was there said: "Enough, however, here appears to justify a refusal of a preliminary injunction unless the adjudication in the Millheim case is to be considered as conclusive against the defense of prior use at this preliminary stage of the case. But the proofs before the court disclose circumstances connected with that adjudication, which, I think, ought to deprive it of such effect. It appears that the American Bell Telephone Company was, and is, the owner of more than one-half of the capital stock of the Western Electric Company, the plaintiffs in the Millheim case, and in this suit, and that by virtue of such controlling ownership, and also by reason of contract relations between these companies, said two companies were and are jointly interested in this litigation on the Carty patent, their common interest being to sustain the patent.

"Now, it further appears that, pending the suit in the Millheim case, the local representative of said Bell Telephone Company, acting in the interest of that company, and for it, bought out the Millheim Telephone Company, and all its property.

"The negotiations for this purpose began in January, 1898.

"The terms of sale were settled on February 10, and the transaction was consummated by transfer and delivery of possession in March, 1898, when the alleged infringing apparatus was taken out by the Millheim lines, and replaced by other apparatus.

"It seems to me, from the evidence, that a real controversy between the Western Electric Company and the Millheim Electric Telephone Company no longer existed when the Millheim case was heard in the Circuit Court on February 17, 1898.

"Certainly, there was no such dispute when that court made its decision on July 18, 1898. It may, I think, be affirmed confidently that, if the learned judge who sat in the Circuit Court had known the facts he would not have heard or decided the Millheim case, and that the Court of Appeals would have dismissed the appeal had the facts been brought to its notice. Lord vs. Veasie, 8 How., 251, 12 L. Ed. 1067; Cleveland vs. Chamberlain, 1 Black, 419, 17 L. Ed. 93; East Tennessee, V. and G. R. Co., vs. Southern Tel. Co. 125 U. S., 695; 8 Sup. Ct., 1391, 31 L. Ed. 853."

Subsequently, much testimony was taken in this case, and it came up for final hearing before Judges Acheson and Buffington. Being fully advised of the facts on such hearing, this court adheres to the view above expressed that the prior decision of this court reported at 88 Fed. Rep., 505, and affirmed by the Circuit Court of Appeals, is not conclusive in the present case.

As the general nature of telephone party lines and the difference between series and multiple systems are quite fully set forth in the prior opinions, they need not be here detailed at length. Suffice it to say the Carty device is of the multiple-circuit construction, and at each station is a permanent bridge in which is seated a bell magnet, with a high coefficient of self-induction and of marked impedance. There are also two other bridges, normally open, and closed only when the station is in use. The telephone bridge circuit, normally open, is closed in multiple arc with its own bell magnet, and, of course, with all others in the line, when in use. The generator-call circuit, normally open, when used, forms a second bridge or cross connection between the wires in parallel circuit with the bridge circuit of its own bell and those of all others in the line. In operation, the tendency of the call current to short-circuit is counteracted by using a bell magnet of high self-induction and impedance.

This not only prevents short-circuiting, but effects a more even current distribution through the bell magnets of the entire system. By means of the numerous windings of the bell magnets, the small portion of the call current passing exerts a marked magnifying effect on the cores and a spirited working of the call signal. Does such combination involve patentable novelty? The solution of this question turns on whether the placing in combination of these elements—all of which, individually, were old in the art—involved inventive genius or was the natural advance incident to the application of electrical engineering skill to the solution of recognized difficulties. In that connection it will be observed the general principles applicable to series and multiple-arc distribution of currents were known and utilized prior to Carty's alleged invention, and that in a multiple-arc system, the current divided itself among parallel bridges in proportion to their several resistances. Moreover, it was known that by the use of magnets of high impedance certain currents would, and certain would not, be allowed to pass. So also, the difference between voice currents and generator-call currents in telephoning was appreciated and the fact that high-impedance magnets were opaque to the former but not to the latter. Now wherein does the alleged invention lie in Carty's arrangement? We take as fairly representative of complainant's contention the statement of Mr. McBerty, an officer of the complainant company and an expert witness, by it called: "The invention of the patent in suit is a many-station or party-telephone line, in which the parts, the different signaling and speech-transmitting instruments, are so adapted and arranged with relation to each other, both at each and all of the stations, that they work harmoniously, each without impairing the efficiency of the other. The central idea of the invention is found in the connection of the different instruments in multiple; the parts at each station are connected in multiple at the station, and the different stations are connected in multiple with the line conductors. As this was not possible with the apparatus arranged for serial connection, the different appliances for the sub-station were also modified by Carty to adapt them to one another in their new relations in the circuit, and, indeed, to make the new arrangement possible; and in the case of the call bell particularly, a new appliance was provided of high resistance and of very high impedance or self-induction. A bell was constructed with long magnets, with more iron than usual, and with a great number of turns of fine wire, the construction

resulting in self-induction so great as to prevent the transmission of telephone currents through it in its place in the circuit. The self-induction of a magnet results from the same condition which makes it a magnet and enables it to do work; and here, in Carty's invention, this quality which, in the series arrangement, had limited the construction of party lines and impaired their usefulness, is taken advantage of, amplified and utilized to construct a bell which may be connected in a bridge of a telephone circuit without forming a diverting path for telephone currents." It will thus be seen that, according to Mr. McBerty, the central idea of the invention was the connection of the different elements in multiple at each station, and the different stations in multiple with the line conductors. That is, Carty put each of the three essentials of a station, viz.: Call, voice and signal apparatus, in its own bridge, and he placed the station itself in bridge with the line conductors. The serial apparatus of the call and voice apparatus were modified to adapt them to the new multiple relation, and "in the case of the call bell particularly, a new appliance was provided, of high resistance and of very high impedance of self-induction." Statements made by Mr. Carty himself, both in an address delivered September 9, 1890, at the Detroit convention of the National Telephone Exchange Association, and also in a letter of November 1, 1890, to the London Electrical Review, commenting on such address, show wherein he considered his invention did and wherein it did not lie. In his judgment, at that time, it did not lie in bridging. His address was on bridging bells, but bridging he explicitly disavows. He then said: "We do not want to make any contention for a patent on bridging. Bridging apparatus is not new. It was advocated in a paper read at Minneapolis last year, and one of the first things that Mr. Hibbard did in the long-distance company was to throw out the looping arrangement and bridge the operators in." In his letters he says: "I would call your attention to the fact that, as shown by the official report of the convention proceedings and all published accounts of my remarks, I did not claim any novelty for the bridging system, per se, being well aware that it had been in use for years, both in Europe and America." Wherein his invention did lie he thus states in the Detroit convention address: "The bell is on exhibition in the rear of this hall. It is a magnetic bell that is much simpler than any yet designed. There is no bottom contact on it, and the bell rings equally well, whether the telephone is on the hook or off. The construction of that bell is very little different from some other bells that are made to do the work, but when you come to use 10 or 15 stations on a line, you have got to have exactly that construction, and it is such an important matter to the licensee that we are making great effort to get a patent upon it. In designing that we not only have an idea of our immediate wants, but we aimed to get a bell that we could say would work on any line up to 20 stations." This view he confirms in another part of his London letter, where he says: "My invention, however, relates to a specially designed magneto bell, by means of which the talking and signaling on a line containing 20 stations equipped with this bell are equally as good as with a line containing only two stations. These results are not attainable with the ordinary form of magneto bell. The details of the construction of my bell were not described by me at the convention, as the application for patent rights was then pending in the United States Patent Office." It will be noted that the patent in suit is not for a magneto bell, but for a combination of which such bell is an element. These statements are not here cited as constituting an estoppel as against Carty, but they have an important bearing on the statements in his subsequent testimony claiming a broader scope for his improvement. Moreover, the accuracy of this earlier statement is, we think, supported by other testimony.

In testing the alleged patentable novelty of this improvement, the exceeding rapid development of the art is a factor to be considered. Once it was started the country was strung with wires with unparalleled rapidity. In this hasty development attention was naturally first given to city systems provided with exchanges and to long-distance lines uniting large cities. Rural and side lines were of less importance, and, naturally, problems incident to the lines in and connecting large commercial centers demanded and received the earliest and best telephonic engineering study.

Whatever advances were made in these long-distance and exchange systems would naturally be extended later to the development of the less important lines. This reasonable and to-be-expected course of events we see strikingly exemplified in the present case. But while we naturally look to the exchange and the long-distance line for such development, and, in fact, find it there existing, the initial development therein made and the devices used in such systems were not called to our attention in the Millheim case. Taking up first, the exchange system, we find there in use the operator's cord circuit shown in the accompanying sketch (Fig. 1).

A cord circuit is one of several such fixtures at each operator's table before a switchboard in a central office. Its purpose is to connect lines of subscribers for conversation. The method of its use is as follows: At the left of the above sketch is a subscriber's annunciator, or calling-signal drop. This is in the subscriber's, and not in the operator's,

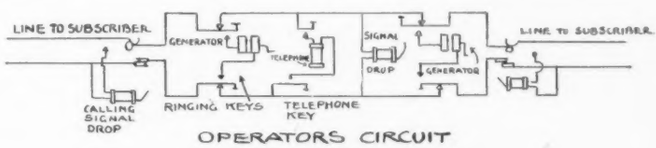


FIG. 1—CARTY PATENT CASE.

circuit. When the subscriber calls the central operator, she plugs into a spring jack on the board, thus cutting out the calling subscriber's annunciator and connecting her cord circuit with his line. At the center of the cord circuit, and normally disconnected from the line at both terminals, but adapted to be connected by spanning the line, is her tele-

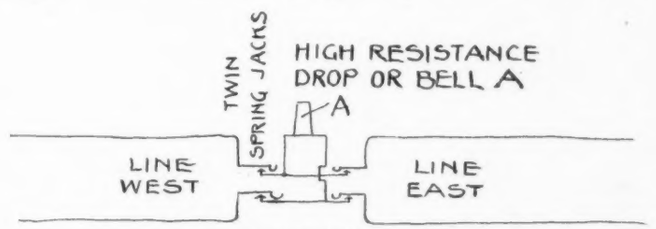


FIG. 2—CARTY PATENT CASE.

phone. By pressing on buttons above and below, she connected her telephone with both sides of her cord circuit and inquired for the number wanted. Having learned such number, she then inserts the right-hand plug of her cord circuit into the spring jack of the desired subscriber. At the right of the cord circuit, normally disconnected from the line at both terminals, but adapted to be connected therewith by spanning the line, is a call generator. By pressing the buttons as before she connects the generator with the two sides of the line of the subscriber to be called, and at the same time, by breaking the contacts with the cord-circuit lines, she disconnects the remainder of the cord circuit from the generator, and, by operating the generator, thus sends a call to the desired subscriber alone. She then disconnects the generator and thus restores the contacts between her cord circuit and the line of the subscriber called. In this situation, which is the condition shown in the sketch, the lines of the two subscribers are connected by a continuous line through the cord circuit. But so long as this condition continues, both subscribers are powerless to break their continuous connection and put themselves in a position to communicate with other subscribers. To do this it is apparent that the agency of the central operator must be invoked, and the apparatus by which this is done must be such that

while it is in a permanent permissible operative relation as a signaling apparatus, it must meanwhile be opaque to the voice currents of the conversing subscribers. Such result was effectively secured by the device in the sketch marked "signal drop," and known as a clearing-out annunciator. If the electro-magnet which operates the signal drop was of low impedance the voice current would short-circuit and conversation would be unsatisfactory, hence one of high impedance was used, and prevented such result. At the same time the signaling current, either an alternating-generator current of low frequency or a steady battery one, crosses freely and signals. The use of these signal drops and the functional effects secured by them are clearly pointed out by different witnesses. Mr. Dunbar, an expert for respondents, says: "The disconnecting annunciator was normally bridged across the main wires of the circuit, ready to receive a disconnecting signal sent over the line by either of the connected subscribers, and was thus bridged across the two wires of the main line while conversation was taking place between the two subscribers. This disconnecting annunciator was wound to a high resistance and high inductance, so that but little of the telephone current would be shunted or short-circuited through this path, and also so that this disconnecting annunciator would readily respond to the generator currents sent over this same main line from either subscriber's station. These disconnecting annunciators were used to give a visual indication to the operator, by the releasing of a shutter through the agency of an armature attracted by the high-wound magnet of the annunciator. Such visual signals were, of course, better adapted for attracting the attention of the operator at the central office than the bells used at the subscribers' stations to attract the attention of the subscribers." Thomas D. Lockwood is an officer of the complainant company, and was called as a witness in his behalf, and acted as attorney for the applicant in preparing the application for and specifications of the patent in suit. He testified in the interference case of Kellogg vs. Scribner, vs. Pickernell, No. 15,754, and his testimony, which Mr. Lockwood discussed when called as a witness in the present case, is quoted by Mr. Dunbar, as follows: "Interrogatory 185. When did you first know of the use in any switchboard of annunciators whose cores were wound to a resistance of 500 ohms, and when, if ever, were coils of that description used in the Boston board, and when, if they were, and you know, was it determined to use such coils in that board?"

"A. I suppose that although the resistance of 500 ohms precisely is mentioned in the question, that figure, as there given, means virtually any high resistance for such annunciators—say, between 400 and 1,000 ohms—and I will answer accordingly. The first case of which I know is that of the Paris exchange, and I knew of this in 1884. The resistance of the annunciators was about 400 ohms. Later, when metallic-circuit switchboards were adopted in this country, and used on a large scale—the first instance being the Cortlandt street (New York) exchange switchboard—it became evident very shortly after that switchboard was put in operation that talking was unduly weakened by having clearing-out annunciators in the talking circuit formed of any two lines, and that if clearing-out annunciators were to be used or retained in use, they must be placed in a bridge or in a branch to earth (the latter in the case of grounded lines), and to the end that when so placed in bridge or branch circuit they would not carry off a large portion of the talking current to the detriment of the distant telephone, they must be made of high resistance."

Mr. Pickernell, also an officer of the complainant company, says: "Experimental drops of high resistance were first used some time subsequent to April 8, 1889. The high-resistance bridging drop at toll boards was adopted in the summer of 1889."

The significance of the relation of this prior structure to Cary's apparatus will be seen from the following considerations. It shows the prior use for signaling of a magnet of such high impedance and inductance as to make it opaque to voice currents; such magnet is placed in bridge; the call mechanism, as well of the subscribers as of the central operator, was not in series with the signaling apparatus of the cord circuit. That these signals were visible instead of audible is a matter of mechanical detail; that they were used to end a conversation, and not to open it, makes no difference in principle. They show the use for signaling of a high-impedance bell, opaque to voice currents and in bridge.

We also find in the prior art the apparatus used for signaling intermediate stations of long-distance lines and shown in the accompanying sketch (Fig. 2).

Such intermediate station had a drop or signaling bell permanently bridged on the line. It was used to signal the station operator, so that connection could be made with a local subscriber. Being in constant normal operative relation, it stood ready for use when needed, but being of high impedance and self-induction, it was opaque to the voice currents passing between the principal stations. The cord circuit of the local operator formed the remainder of her set. When the operator was signaled she plugged into the line, and that brought her cord circuit, with its telephone and generator, into operative connection with the line. It will be noted the telephone was out of connection with the line, as in the Carty device. The operator in the long-distance station brought it in by pressure on buttons or the like, while in Carty's device it was brought in by the subscriber removing it from the hook. These differences were merely mechanical, as were also those incident to the generator. Both were normally disconnected; when in use both were in bridge. The functions of this device and its use prior to the Carty patent are shown in the testimony of Mr. Pickernell, who says: "High-resistance magnets were first used at intermediate stations some time after November 14, 1899. I can't state just how long after it was. I find that on November 14 I advised the manufacturer of the magnets for the use at intermediate stations that the sample that was then submitted to my approval was defective, and I returned this sample on that date for correction. It probably took several days to correct the sample, and probably several weeks to manufacture a lot of bells." The witness further testified, in reference to the foregoing sketch, that the bell or drop marked (A) was of high resistance and high self-induction; that it was used for signaling an operator at an intermediate station (as a line signal); that "this drop was made of high resistance and high self-induction so as to prevent the passage or shunting of the telephone current when the circuit was used for transmitting speech between the terminal stations." The proofs established these facts: The signaling bells were of high impedance and high self-induction; they were mounted in bridge; they were in bridge alone; they were used for initial signaling—conditions akin to those of Carty's system.

Indeed, that the whole telephonic art was in a state of rapid but regular development; that the two devices described were the natural outgrowth of such progress, and that Carty's device was one of the regular steps of such advance when party lines came to receive their due share of skilled electrical attention, is clear. Some phases of such development are shown in the public addresses made by Messrs. Pickernell, Hibbard and Carty, their testimony and the part they bore in such advance. These three trained electrical engineers were all in the employment of one company, and engaged in the introduction of long-distance lines in the East. They joined in the preparation of a paper, entitled "New Era in Telephony," read before the Minneapolis convention of the National Telephone Exchange Association, held September 11, 1889, and composed of electrical experts. The substitution for grounded lines of metallic circuits constituted the "New Era" to which the paper referred. To this change and its attendant problems the highest electrical thought was given, and the change naturally caused many advances in constructive and operative methods. Among other elements was the multiple-party line.

This paper, at the time it was read, caused a great deal of comment among telephonists. After discussing the advantages of metallic circuits, it refers to the subject of party lines as follows: "With the extension of metallic circuits it is often asked how they may be utilized for the service of two or more subscribers on the same circuit. Probably the best results are accomplished by bridging the different instruments on to the two sides of the metallic circuit, using a ringer magnet at each instrument of high resistance and retardation. By this arrangement the electrical balance is preserved, and no alteration in the ordinary form of operating apparatus is made necessary.

"It has been the practice heretofore to loop intermediate sets of instruments into a circuit. At first this practice was persisted in when metallic circuits were introduced, additional instruments being looped into one side of the circuit. Such an arrangement, however, destroys the balance, and the instrument so connected will be subject to disturbance as long as the line is capable of producing, and it will also be a source of disturbance to the other instruments in the circuits. By connecting all instruments, however, in multiple arc, bridging across the circuit, nothing is lost in transmission, if the coils have sufficient retardation, and the electrical balance necessary to the proper working of the system is preserved. The disclosures of these three trained men to their fellow electricians are important in this case. The long-distance lines with which they were associated represented the highest state of the art. The high impedance electromagnet was long before known. Mr. Lockwood, in the interference case quoted elsewhere, says: "But as early as 1884 it was seen that by properly placing the retardation coils, or coils which enclosed or were enclosed by iron in or in relation to telephone circuits, this impedance, which theretofore had been an unalloyed evil, might be made useful by causing it, in complicated systems of telephone circuits, to guide telephonic currents into routes where they were desired, and to prevent them from passing into portions of the systems of circuits where they were not desired."

But while its theoretical capacity was known, it was now being put into practical use in these metallic circuits in clearing-out drops and line annunciators. It nowhere appears that these magnets had been applied to any metallic-circuit, multiple-party lines for individual subscribers, or, indeed, that any such lines existed. But these men, from their experience with the metallic circuits of the new era, were so confident of the possibility of applying to party lines the same general practices they had tested on the long-distance lines that they felt even then justified in confidently defining to their fellow engineers the means by which the party-line problem would be worked out. At that very time they were in the midst of the advance. Mr. Pickernell says: "Experimental drops of high resistance were first used some time subsequent to April 8, 1889. The high-resistance bridging drop at toll boards was adopted in the summer of 1889." It is true, he also says: "High-resistance magnets were first used at intermediate stations some time after November 14, 1889. I look upon the paper entiled 'New Era in Telephony,' prepared by Messrs. Carty, Hibbard and myself, as being in the nature of a prophecy, for I am certain that the high-resistance magnets were not used prior to the above date." But the importance of the disclosure is increased, not lessened, by the fact that it was a prophecy. The subsequent successful application of the general principles of the disclosures to successfully signal intermediate stations shows the importance and the truth of the prophecy. Now, it seems to us, that the Minneapolis instructions were the lines along which Carty subsequently worked, but the way was clearly pointed out by the joint article of the three men. Mr. McBerty, as we have seen, says: "The central idea of the invention is found in the connection of the different instruments in multiple," but this was but carrying out the Minneapolis instruction. The broad principle was embodied in the cord circuit and the long-distance intermediate station, both of which are clearly shown by the proofs to have been in use prior to Carty's alleged invention. The application of this principle to party lines lay in engineering skill, not inventive genius. Hibbard's work concerned the improvement of ringer drops, while Carty's concerned party lines. Hibbard says: "I was interested, at that time, in the development of the bridging drop, and bridging bells were first put into operation by others. In this article the methods which had experimentally been found to be the best up to that time for long-distance work were recommended for local work. The plan of bridging the ringers was proposed, I think, by Mr. Carty." In view of the quite explicit directions for bridging embodied in this article and in view of the successful use of magnets of high resistance and self-induction in the cord circuit and long-distance station, there would seem to be but little question that any one of these trained engineers, if directed to correct the recognized evils of party-line systems, would have done so in the same engineering lines followed by Carty. If, in carrying out these broader general principles he invented, as he said in his London letter, "a specially designed bridging magneto bell," he was entitled to patent protection therefor, but the invention of such a bell did not warrant him laying claim to the broad principle of connecting the different instruments in multiple. In view of the prior development of this art evidenced by the devices to which we have referred in detail, and the definite prior knowledge of the electrical profession of the principles of bridging, multiple construction and the use of magnets of high impedance and self-induction for signaling purposes and to prevent the shunt and loss of voice currents, we are of opinion that the combination shown in Carty's patent involved no patentable novelty. Such conclusion is not at variance with the opinion in the Millheim case, 88 Fed. Rep., 509, or of the Circuit Court of Appeals. Those cases were rightly decided on the facts before the courts, but the actual state of the art was not then called to the court's attention. It was there found that every element of Carty's device was in itself and individually considered old. The novelty lay in their combination; for it was not shown any such combination had been made before. It was said "The call-signaling apparatus of the Carty system is so vital to its use that either it or its substantial equivalent should be found in the alleged anticipation to constitute it a real anticipation. We now find that there were in existence in the clearing-out drops and the signaling apparatus of the long-distance lines, such application of the principles on which Carty's combination rests that their application to party lines was but the natural and to-be-expected advance in the progressive art to which they appertained. To use, with some changes, the language of another, Atlantic Works vs. Brady, 107 U. S., 1927, we may say that the development of this, as of every great industry, has developed a constant demand for new appliances, which the ordinary skill of those versed in such branch has generally been adequate to devise, and which devising is the natural outgrowth of such development. Each forward step prepares the way for another, and to burden a great industry with a monopoly to each improver, for every step thus made, except where marked by an advance greater than mere engineering skill, is unjust in principle and hostile to progress. As our conclusion that the Carty patent is invalid for lack of patentable invention goes to the root of the case and is decisive against the complainant, we do not think it necessary for us to discuss or pass on the other serious defenses to this bill, namely, the defense of prior use at Crown Point and Merrillsville, Ind., and on the Wilmington Coal line in Chicago and the defense of non-infringement.

Acheson, Circuit Judge—

The final hearing of this case took place at Pittsburg, and at my request Judge Buffington sat with me and has prepared the opinion of the court, which I file herewith. I fully concur in the views Judge Buffington has expressed, and, accordingly, a decree will be entered dismissing the bill of complaint with costs to the defendants.

FOUND BY THE TELEPHONE.

BY STANLEY WATERLOO.

There were not in thriving Adsumville, with its eleven thousand inhabitants, a finer pair of lovers than John Bathurst and Amy Conkling. Each belonged to a good family, each was handsome and each somewhat more than high-spirited. It was the last quality in them which, in the end, caused trouble. They were ardent in their mutual regard, and confident and trustful, but there had occurred since their engagement more than one slight skirmish between them, though never what might be termed a battle royal. That was to come. John, known to his sweetheart and everybody else as "Jack," was employed in the office of the paper mill; Amy was the daughter of the manager of the city's telephone system. Jack was six feet in height, broad-shouldered, blue-eyed and brown-haired. Amy was small and slender, owning gray eyes with a gleam in them and hair of that charming red which is said to have belonged to Cleopatra, and which certainly has belonged to later famous beauties of whom we know more than of the Egyptian queen. They made a striking couple, because of this very contrast, and their friends, of whom there were hosts, rejoiced that they had come together. They were known to everybody. Amy belonged to many societies, among them the woman's branch of the S. P. C. A., and Jack was a popular fellow, an all-round athlete and counted the best wing shot in the region. They were esteemed a credit to the community. They were to be married in the spring.

It was an exceptionally fine evening in October when Jack strode springily toward the home of the girl he counted superior to any other girl in the world. The sun was just sinking; the western sky was ablaze, making the hard maple leaves, already red, seem redder still from its reflection; there were flaming streaks in the river; the later birds were twittering in the trees; the later garden flowers gave forth a fragrance and the air was cool enough to have a bracing quality. There had been a well-contested pigeon shoot in the afternoon—the first ever taking place in Adsumville—and Jack had won the medal. This pleased him. He was about to meet Amy and this elated him. There were few men in the world who were in better spirits than the man who opened the gate to the Conkling homestead this splendid October evening.

Amy met him at the door and was kissed with the vigor and repetition becoming a man of Jack's inches and inclinations. She responded as a matter of course, but not, as it somehow seemed to Jack, with that degree of modest fervor to be expected of an engaged young lady with her color of hair. He did not complain. It was enough for him that he was with her. He talked away merrily for a time, but her answers were constrained. She seemed to take no interest in what he was saying. Finally, he could stand it no longer.

"What's the matter, Amy?" he broke out.

"Oh, Jack, how could you!" was the irrelevant answer.

"Could what?"

"How could you kill those poor pigeons? It was wicked. It was more than wicked; it was brutal!" And her indignation expressed itself in quivering words and flaming eyes.

The young man was aghast. He could not understand it. For the moment he had nothing to say. In all the city there was no more tender-hearted man than Jack Bathurst. At that very moment there was in his rooms a stray dog with a broken leg which Jack had conveyed there stealthily that he might put the limb in splints and feed the beast until it should be fit for release, to seek its fortune in the world again. He never knowingly stepped even upon a worm crossing the sidewalk. He had a regard for every living thing. This sudden accusation dazed him. He wondered vaguely if there could be any justice in it? He pondered for a little time and then his common sense came to the rescue. He felt that this impulsive girl did not quite know in all its bearings what she was talking about. But her heart was in the right place. He spoke soothingly:

"Why, Amy, there was no wickedness nor brutality about it. The birds must be killed and eaten sometime, anyhow. They merely died the easiest death."

The girl's eyes but blazed the more. "That is but an excuse for murder. It was but the instinct of killing which impelled you. You know well enough—I have read all about it—you know well enough that these birds are bred especially for one purpose, bred so that they will be strong and fly well. It is a fact."

"Then they're the luckiest among pigeons," was the reply. "To live a cared-for, healthy life and then die suddenly and painlessly—what more could a pigeon want, or, for that matter, a human being either?"

The girl's anger was increasing. "You but quibble," she cried. "There are other things. Some of the poor creatures are not killed at once; they are only wounded and when they fall outside what you call your 'bounds' they are left to perish miserably. You know that is true."

The man loved this young woman with all his heart, but he was getting a trifle impatient himself now. There was a shade of reproof in his voice. "I'm afraid, Amy, that you don't quite understand. Those that fall out of bounds are secured by men hired for the purpose and killed instantly. This is the care of, and the rule with all decent shooting clubs. Of all the birds which left the traps to-day not one was unaccounted for. Occasionally one may escape. Occasionally a broken-legged fowl is found dead in the coops which come to old Johnson, the chicken dealer. Old Johnson sells pigeons, too. Compare the fate of the pigeons killed to-day with that of those Johnson sells. That boy of his almost tears their heads off. I lost my temper the other day, after seeing a little of the performance, and bounced in there and read Johnson a lesson and taught them how to kill pigeons scientifically. But dear," and his voice became tender, "I've seen your pretty teeth in pigeon pie when the pigeons came from Johnson's. And," he added chaffingly, "You see you were encouraging the killing of more pigeons by the Johnsonian method. The only fault to be found with us to-day is that he hadn't hired us to do the work. He has the pigeons now. Don't be absurd, dear."

But the blood of the young lady was up. "You are heartless," she cried. "What do I care about Johnson. And it isn't true what you say about pigeons not getting away. Why, only a few days ago I was calling on Mrs. Tollings and she told me that once where there was a pigeon match somewhere a poor cruelly wounded thing came fluttering into her very yard."

The man was becoming angry now. "You won't listen to reason," he exclaimed. "Of course one in a thousand may die so, just as they may die, only more miserably, with the dealers. As for Mrs. Tollings; that professionally reforming old hen—"

But he got no farther. The girl leaped to her feet. "You needn't say any more. No man could talk as you have who was not naturally bloodthirsty and cruel—yes, brutal!"

The man's temper had gone glimmering now. He spoke coolly enough. "It must be hard for a woman to marry a brute."

"I, at least, do not intend to."

"Does that mean that you do not want to be my wife?"

"Yes."

And without a word John Bathurst took up his hat and went into the outdoor phase of the fine October evening. It did not seem so fine as before. Perhaps that was because it was later.

A strong and stubborn man was John Bathurst; but such as he are those who suffer most when the river we call love is dammed. To no man worth the name comes disastrous separation from the woman he cares most for without an emptiness to life, without endurance of such suffering as time alone may or may not assuage. He may not walk

about with a lump in his throat, but there must be a lump in his heart, which is a great deal worse. So, in the performance of his work, moved John Bathurst, hoping for slenderly, but scarce expecting, some message from the girl who had discarded him, and far too proud and obstinate to engage in any pleading for himself. There came no word and there came a day when he could endure it all no longer. He resigned his position in the paper mill and Adsumville knew him no longer. He had come from the East, had no relations in the little city and, when he departed, chose to tell no one of his aims or destination. He was lost.

The objective point of the man was the great city by the lake, the city of which all men know. Thoroughly familiar with the business in which he had been trained, feverishly impatient to become immersed in work into which he could throw himself heart and soul, and obtain, perhaps, a degree of forgetfulness, he connected himself with a great paper house and labored as men seldom do. Forceful, acute and fiercely energetic, he advanced with marvelous rapidity. At the end of two years he was manager, at the end of three he was a partner in the big concern.

It is possible that a woman stricken in love does not suffer in the same way as does a man, but the chances are that the difference, if there be any, is in quality rather than degree. Suffering there came certainly to Amy Conkling, and there came a time, too, when, accusing herself, she forgot her pride and wrote a little note asking her lover to come to her again. There was no reply. She learned soon that Bathurst had left the city and that none could give his address. It was a different, but not a better world to her after that.

A year later Mr. Conkling, who was a widower, died. Amy was his only child and the two had been like cronies, the daughter assisting him in his business in addition to the management of his home. He had been a careless, generous man and left no money. Amy retained a position with the company for a time, but there came favoritism and changes and the girl found herself alone and nearly penniless. There was but one recourse. She had relations in the big city, a family in straitened circumstances, and to them she must come for a home while seeking occupation. She made few adieus and left no address. She, too, was lost to Adsumville.

John Bathurst had succeeded in life, but he had not succeeded in forgetting. There came to him one day an impulse which would not be repressed. Pride be hanged! He must find Amy again! He reproached himself bitterly for leaving her without an attempt to win her back. Why had he not been more enduring with her? It was the duty of the stronger to do the enduring. Surely she had not meant all she had said. He knew that well. The next day found him in Adsumville, and the one following saw him in his office again, gray-faced.

Amy found a place eventually as telephone girl in a huge publishing house. All day long she sat at her little desk, ear to the 'phone, pulling out this plug and pushing in that one, listening to and giving and receiving messages to and from growling outsiders, querulous foremen, captious heads of departments and all sorts and conditions of men and women. A creature overworked and under a constant nervous strain, even her exceptional courage could not sustain her. She grew thin and wan and ever weary.

Between big publishing houses and big paper houses there are constant, close relations, generally acute. There came a rainy, dismal forenoon when the bell rang sharply in the ear of the tired girl at the telephone. To her somewhat weak "Hello" came response in a curt message demanding immediate reply. That answer never came. The poor girl gasped, turned paler still, then, led by a desperate impulse, she cried out through the instrument:

"Jack! Oh, Jack!"

There was silence for a moment and then the answer came in a voice strangely hoarser now:

"Amy; Amy, my girl; is that you?"

"Ye-es—Ye-es, Jack," was the sobbed out reply.

There was no hoarseness nor hesitation now in the voice that answered. It was joyously imperative:

"It is half-past eleven o'clock now, Amy. At a quarter after twelve be down on the street at the main door of your building. Do not fail me!"

At twelve o'clock, the lunch hour, the trembling girl resigned her place to another and then, after bathing her tear-stained face and donning her wraps, went down the stairs to the doorway. A carriage whirled up, a big man leaped out, and then, she scarcely knew how, she was in the carriage with him. A few moments later they sat facing each other at a table apart in a soberly fashionable restaurant. The man looked at the woman and tears came into his eyes.

"Oh, my girl, how much you have endured! I know all about it now."

She did not answer. She could not. The man broke out impetuously.

"Do you love me still, Amy? Will you marry me?"

She could but look at him tearfully, but her eyes gave the answer well enough.

"You're not going back to that place again. "Here—" and he called a waiter and sent him on an errand. Then he scribbled a brief note and gave it to the messenger boy who soon came in. "You needn't bother about that any more," he said to the girl.

He gazed upon her lovingly, gloatingly, for a full minute, then said vaguely and foolishly:

"I'll never shoot a pigeon again."

The girl found her voice now. "Yes you will, dear, if you want to. If the poor things have got to be killed I think that's the best way."

And since she could talk now, many other things they said, but who shall or should record them? And who said the day was rainy and dreary? Why it was bright as gold—brighter even than was the first part of that distant October evening.

KANSAS INDEPENDENT TELEPHONE CONVENTION.

The first meeting of the Kansas Independent Telephone Association was held at Topeka, Kan., on January 28, there being about one hundred Independent telephone exchanges represented.

The principal objects of the state organization are set forth in the following recommendations of the committee on permanent organization, that are embraced in the constitution and by-laws that were adopted:

"To establish a uniform system of toll lines, rates and system of accounts.

"To provide through metallic trunk lines connecting county seat towns with Topeka and Kansas City.

"To secure favorable legislaton and just taxation.

"To protect the Independent telephone interests from unfair and unbusinesslike competition."

Corporations, companies and individuals operating Independent telephone systems only are eligible to membership in the association.

Membership fees are $5, with an annual assessment not exceeding 2 cents per 'phone operated by the company or individual, and 2 cents per mile of toll line operated.

The executive committee will be empowered to levy assessments for use when occasion arises that its use will be required.

The association decided to hold its meetings in January of each year. The following officers were elected for this year: A. R. Chaplin of Newton, president; B. F. Pankey of Topeka, vice-president; J. W. Smith, treasurer, and C. E. Wells of Marion, secretary. The following were elected to compose the executive committee: W. H. Wilson of Smith Center, C. L. Brown of Abilene, J. E. Byers of Ottawa and E. H. Berry of Atchison.

TRADE NOTES.

WILLIAM J. MURDOCK & CO., Chelsea, Mass., will be pleased to send their catalogue relative to the several styles of telephone receivers which they manufacture.

THE NUNGESSER ELECTRIC BATTERY COMPANY, Cleveland, Ohio, is soon to move into a large new building erected for the manufacturing accommodations of this company.

THE AMERICAN ELECTRICAL WORKS, Providence, R. I., manufacturer of bare and insulated electric wires, exhibits a handsomely embellished lithograph of Volta on its new calendar.

THE VALENTINE-CLARK COMPANY, Chicago, Ill., makes a specialty of cedar poles. A booklet descriptive of its various pole yards and treating on cedar poles in general will be sent upon request.

THE CHASE-SHAWMUT COMPANY, Boston, has just issued a book on electrical data which is very comprehensive and should be in the hands of every telephone company. The book will be sent free upon request.

THE ST. LOUIS ELECTRICAL SUPPLY COMPANY, St. Louis, Mo., is preparing a new catalogue, which will be very complete and up to date. The company would like to correspond with all manufacturers interested.

FRED M. LOCKE, Victor, N. Y., manufacturer of porcelain insulators for all electrical potentialities, manufactures a special porcelain telephone insulator which is claimed to be stronger than glass for telephone construction work.

THE MALTBY LUMBER COMPANY, Bay City, Mich., offers poles for telephone, telegraph or electric light service, and in view of its being located in the lumber regions of Michigan, its facilities are excellent for prompt and careful shipments.

THE WARNER ELECTRIC COMPANY, Muncie, Ind., is shipping its well-known switchboard battery generator to many foreign countries. The company is prepared to furnish its generator, producing pulsating currents, for selective signaling.

THE TELEPHONE MANUFACTURING COMPANY of Sumter, S. C., is presenting a beautiful calendar hanger, in colors, which carries an immediate suggestion of the trade name "Imperial" borne by the telephones and switchboards of the company.

THE IMPROVED PRIMARY BATTERY COMPANY, 594 Broadway, New York, is now manufacturing the Baines primary battery for telephone service, or for any purpose requiring a constant current. Strong claims are made for the efficiency of this battery.

THE STANDARD ARM AND PIN COMPANY, Laurel, Miss., now has its new manufacturing plant in operation. It will manufacture crossarms, brackets and pins for telegraph and telephone poles. The company also operates plants at Gadsden, Ala., and in Georgia.

THE VARLEY DUPLEX MAGNET COMPANY, Phillipsdale, R. I., and Chicago, is issuing catalogue No. 6, descriptive of telephone magnets. This company is exclusive manufacturer of the Varley automatic machine-wound magnets in either insulated or bare wire coils.

THE CHASE-SHAWMUT COMPANY, Boston, announces, under date of February 1, that a serious fire in its factory has so crippled the company that it will be unable to fill orders for the present. The company will rebuild at once and asks a continuance of favor from its many customers.

THE INTERNATIONAL TELEPHONE MANUFACTURING COMPANY, Chicago, has begun introducing its new line of apparatus by supplying a heavy demand for its new patented switchboard ringing and listening key. The International key is meeting with favor as a short and compact circuit changer for central energy, multiple, exchange and toll-line switchboards, with its contact springs of sufficient length and size to allow proper space for making and breaking contacts and avoiding the breaking of the spring.

THE GLOBE AUTOMATIC TELEPHONE COMPANY, Chicago, is erecting exchanges in the towns of O'Neil, Neb., Crystal Lake and Ellsworth, Minn. The company is daily receiving inquiries about its automatic system from all parts of the country, and the exchanges which have already been installed are giving entire satisfaction.

THE ACME ELECTRIC COMPANY, Chicago, has issued a little book of pointers, which is attractively gotten up and is of more than ordinary interest. One of the pointers says: "Take things as they come—but remember there are lots of things it will pay you to go after." This little book is one of them. It will be sent to anyone upon request.

THE ILLINOIS ELECTRIC SPECIALTY COMPANY, Chicago, has removed its offices from 1203 Marquette building, to 510-512 Tacoma building, where the company will be pleased to meet its many friends. The demand for the company's direct reading ohmmeters has been so great that it necessitates the running of the factory overtime.

THE STODDARD TELEPHONE CONSTRUCTION COMPANY, Monroe, Mich., is sending out a postal card entitled "A Corker." It makes a special offer on the company's No. 85 telephone, which the company fully guarantees, and sends on approval. Attention is also called to the company's catalogue, which will be sent free upon request.

THE CENTRAL ELECTRIC COMPANY, Chicago, will be pleased to quote on application prices on I. X. L. weatherproof, slow-burning, and slow-burning weatherproof wire, office, annunciator, magnet and galvanized telephone wire. The company will also gladly furnish prices on Okonite insulated wires and cables for aerial, submarine and for general use where an insulated wire is required.

THE SUMTER TELEPHONE MANUFACTURING COMPANY, Sumter, S. C., will have a very complete exhibit of central-energy and magneto telephones, switchboards and telephone appliances, located in section L2, of the Electrical building, Charleston Exposition. The exhibit will be in charge of Mr. L. G. Le Bourveau. It is requested that telephone men visiting the exposition make it their headquarters.

THE SUN ELECTRIC MANUFACTURING COMPANY has recently removed its factories and general offices from Philadelphia to Westchester, Pa. The buildings which it occupies have been designed, erected and equipped in accordance with modern methods for telephone manufacturing. The company is enlarging its lines of telephone instruments, switchboards and accessories, and it purposes to largely increase its output during the coming year.

THE S. H. COUCH COMPANY, 200 Summer street, Boston, Mass., is the name of a new telephone manufacturing company just organized by Samuel H. Couch, formerly with the Couch & Seeley Company. Mr. Couch announces that he has disposed of his entire stock and interest in the Couch & Seeley Company and that the new company is prepared to furnish all types of telephone instruments and switchboards, either magneto calls or central energy systems; also interior systems, terminal heads, distributing boards, protective devices, magneto bells and other telephone accessories.

THE STANDARD TELEPHONE & ELECTRIC COMPANY, Madison, Wis., has recently received a number of good-sized orders for switchboards and telephones, and inquiries from all over the United States indicate a

heavy spring trade. The Standard Company makes a specialty of furnishing telephones for farmers' lines; also for party line service. All telephones manufactured by the company are equipped with the celebrated Milde transmitter. General Manager Parish has secured the services of Mr. W. A. Taylor, a well-known telephone engineer, who will design the company's new apparatus.

THE UNITED STATES ELECTRIC MANUFACTURING COMPANY, Butler, Pa., is now offering the selective lock-out party-line telephone system as being thoroughly commercialized. This system was recently illustrated and described in this journal. It is designed for use on isolated lines and exchange service, as it may be applied to any exchange board. Thirty-five telephones may be operated on one line, and calling all subscribers when only one is wanted is done away with. This company has recently purchased the patents of the Drake Telephone Company, covering the Drake selector and battery cutout.

THE WESTERN ELECTRICAL SUPPLY COMPANY, St. Louis, reports that its Independent telephone business has opened up this year in a most gratifying manner, and its factory is crowded with orders. The company has recently made a number of improvements in its switchboard and telephones, and is now putting out some of the highest grade telephones on the market. Special attention is called to the company's central-energy switchboards for small Independent exchanges. It is stated that wherever these boards have been installed they have given the most complete satisfaction. The company issues a very attractive bulletin, covering an entirely new and up-to-date line of telephones, which will be mailed upon application.

THE CONTINENTAL TELEPHONE CONSTRUCTION COMPANY, Chicago, has closed a contract for the construction of the new Independent telephone exchange at Freeport, Ill. The contract calls for the construction, installation and equipment complete of 600 telephones, with an ultimate capacity of 1,500. In the fire district all lines to be laid in conduits and red cedar poles are to be used exclusively in the aerial construction, thus making one of the finest plants in the city. This company is also at the present time building an exchange at Petersburg, Ind., and rebuilding the entire county. On account of increase in business this company has found it necessary to seek larger quarters and will now be found at 510-512 Tacoma building.

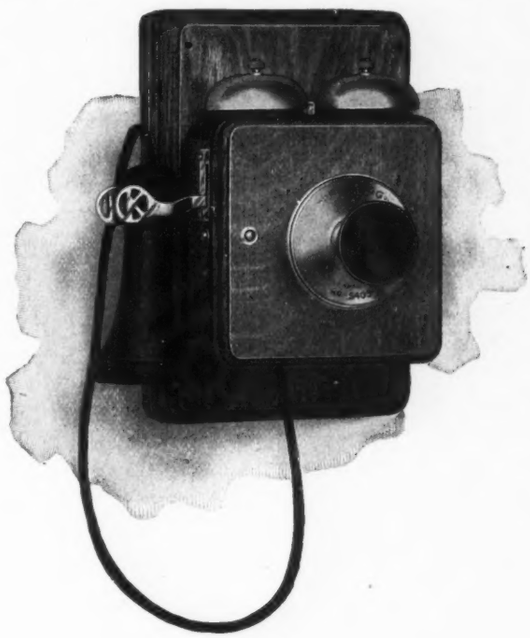
THE AMERICAN ELECTRIC FUSE COMPANY, New York, Chicago and Atlanta, has just issued one of the most attractive advertising novelties in the shape of a "Baby Book," printed in colors, and containing the pictures of forty babies, besides illustrating and describing the entire line of apparatus manufactured by the company. The preface to the booklet was evidently written by one who knows and loves babies. It is so good we give it in full: "The world is full of babies, each and every one of which is just a little brighter, prettier and smarter than any other baby ever born. Baby smiles have brought sunshine into darkened hearts. Baby hands have helped to lift the heavy weight of care. Baby feet have made well-beaten pathways in our lives. Babies are the greatest blessing of mankind. Men hold the reins of government throughout the world; their wives rule them, and over both the baby's hand holds the kingly scepter of a baby's love. To the babies in this book, and to all babies everywhere, we dedicate these pages, in the hope that through the prosaic web and woof of business may be woven the golden threads of common interest in his majesty the Baby." This booklet will be sent free to any part of the world upon request if this publication is mentioned.

TELEPHONE DAY AT CHARLESTON.

March 19, 1902, has been set aside as Independent Telephone Association day at the Charleston Exposition. It is expected there will be a large attendance of Independent telephone men on that day.

CENTRAL-ENERGY HOTEL TELEPHONES.

In response to numerous inquiries that were received regarding high-class instruments for hotels, residences and other places where a small, well designed and compact telephone set is needed, the Kellogg Switchboard and Supply Company of Chicago has recently brought out the instrument here illustrated for this type of work. The apparatus is standard and has the same type of hook-switch, of ringer, receiver and transmitter as the same company's regular central-energy exchange telephones. The base of the instrument contains a condenser of the company's own make. It is stated that the Kellogg Company is considerably the



largest manufacturer in the United States of condensers for telephone purposes.

It will be noted that the set exhibits no binding posts or any other parts so exposed as to render them liable to be put out of order. The clapper of the bell is covered with a small guard to prevent people from changing its adjustment or tampering with it in any way. The apparatus is, of course, of the long-distance type and may be used in connection with the regular central-energy exchanges, and for any long-distance conversations of which the regular exchange apparatus is capable. The new line of apparatus is believed to meet a really considerable want. The beauty of its general design and appearance may readily be seen from the accompanying illustration.

CHICAGO VISITORS.

A party of representative telephone men from South Bend and Logansport (Ind.) telephone exchanges, consisting of the following: Hon. W. J. Vesey, W. E. Massman, G. W. Pixley, C. H. Warden, E. H. Yarnell, S. M. Foster and C. A. Wiley, were in Chicago on January 29, where they visited the plants of all the leading telephone manufacturers, including that of the Kellogg Switchboard & Supply Company, from whom they recently bought a 3,000-line common battery exchange for Logansport, and which is about ready for operation. These parties are also about to install an exchange of 2,000-line capacity at South Bend, Ind.

The Illinois Telephone Company of Jacksonville, Ill., awarded contract January 28 to the Kellogg Switchboard & Supply Company for all necessary apparatus for their new common battery telephone exchange of 2,500 ultimate capacity. It is anticipated by leading authorities that within a year they will have 2,500 local subscribers.

THE CHICAGO TELEPHONE SUPPLY COMPANY.

In this issue of TELEPHONY is presented some views of the factory of the Chicago Telephone Supply Company, wherein are made the telephones that satisfy. This company, which was formed in 1895, and incorporated in 1897, has rapidly forged to the front, until to-day it is a considerable factor in the Independent telephone manufacturing field. It manufactures a complete line of telephones, switchboards, magneto bells, transmitters, receivers, accessories and supplies, and is located at 133-139 South Clinton street, Chicago.

The company has in preparation a complete central-energy system, which will be ready for the trade within thirty days. The system is said to embody many special features of merit new to the telephone field, and prospective purchasers of central-energy equipment are requested to correspond with the company, who will send printed matter descriptive of its entire line of apparatus.

The officers and heads of departments are:

G. A. Briggs, president; H. L. Briggs, secretary and treasurer; A. J. Briggs, general manager; T. Y. Lynch, cashier; H. C. Randall, purchasing agent; H. P. Didriksen, manager sales department; M. R. Ruegnitz, manager correspondence department; H. M. Fisk, superintendent switchboard department; M. B. Brooks, superintendent assembling department; F. B. Becker, superintendent machine department.

The company has a large export business, making shipment of its product to all parts of the world.

A specialty of this company is its bridging apparatus for heavily loaded farmers' lines. The Chicago six-bar bridging telephone is claimed to excel anything of its kind offered to telephone buyers.

The views are self-explanatory, so no detailed description is necessary.

Telephone men visiting Chicago are requested to visit what the Chicago company calls its great mail-order factory.

FACTORY, CHICAGO TELEPHONE SUPPLY COMPANY, CHICAGO.

OFFICE OF PRESIDENT AND GENERAL MANAGER, CHICAGO TELEPHONE SUPPLY COMPANY, CHICAGO.

GENERAL OFFICES, CHICAGO TELEPHONE SUPPLY COMPANY, CHICAGO.

STENOGRAPHIC DEPARTMENT, CHICAGO TELEPHONE SUPPLY COMPANY, CHICAGO.

MACHINE DEPARTMENT, CHICAGO TELEPHONE SUPPLY COMPANY, CHICAGO.

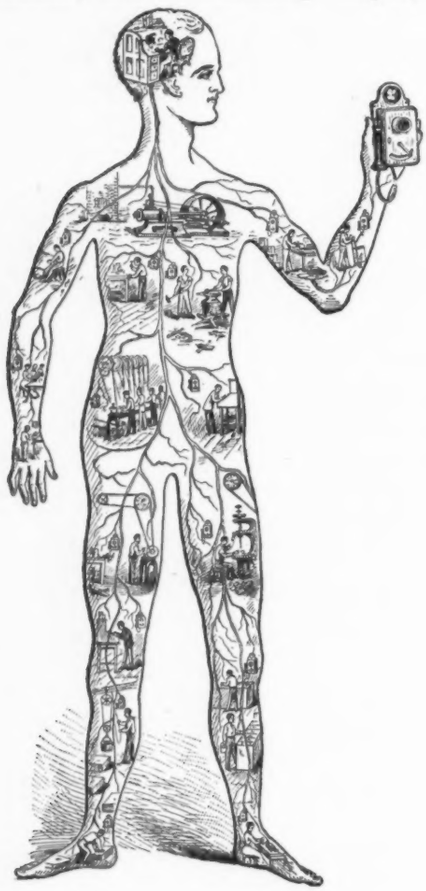
ARMATURE WINDING DEPARTMENT, CHICAGO TELEPHONE SUPPLY COMPA NY, CHICAGO.

ASSEMBLING DEPARTMENT, CHICAGO TELEPHONE SUPPLY COMPANY, CHICAGO.

SHIPPING DEPARTMENT, CHICAGO TELEPHONE SUPPLY COMPANY, CHICAGO.

HOLTZER CABOT BOOKLET.

One of the most unique booklets published has recently been issued by the Holtzer Cabot Electric Company of Brookline (Boston) and Chicago. It explains the company's automatic, intercommunicating telephone systems,



and gives a partial list of users in the different states. Through the courtesy of the company we show a skeleton cut—one of the features of the booklet. Upon request the booklet will be sent postpaid to anyone interested.

PAY STATIONS.

One source of annoyance to the telephone exchange manager is the free use of telephones by non-subscribers. Try as he will this cannot be overcome by agreements with patrons. There are a great many users of the telephone who will not subscribe as long as they can run to their neighbor's or to the corner store and use the telephone gratis.

The Bell company grappled with the problem of making these people pay for the service, and found success in the use of pay stations. The enormous number used by the licensees of the above mentioned company is proof of their value. The Independent companies were somewhat slower to adapt themselves to its use. Among the pay station devices for telephone use is one manufactured by the Telephone Pay Station Company, Chicago, and advertised in this issue.

Of perhaps the least importance, yet the first noticed feature, is the appearance of this machine. It is small, being 3½ inches wide, 7⅝ inches high, so that it can be attached to any piece of telephone apparatus. The case is finished in black enamel, with nickel-plated top plate and lever, harmonizing well with the usual finish of telephones.

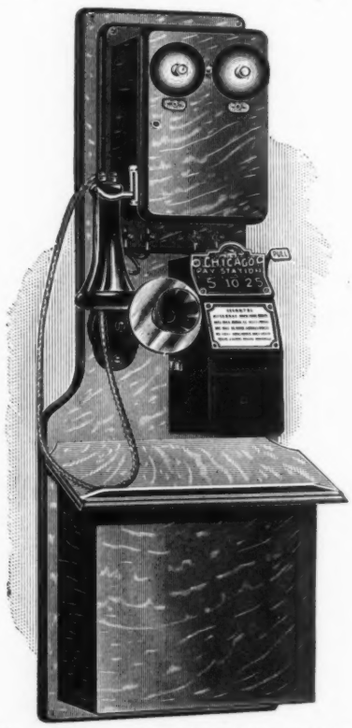
It is mounted either as shown in the accompanying cut, directly on the backboard, or at one side by use of iron-back plate, as shown in the company's display ad. in this issue, perhaps the latter style being best for general use. Four screws are used in the mounting in either way. They are all inside the case, preventing anyone removing it without unlocking the cash drawer.

The operation of the pay station is very simple. A single glance at the directions is all that is ever necessary; in fact, the appearance of the machine really tells the manner in which it is operated.

Upon placing the coin in the slot and pulling the lever the signal is transmitted to the operator strong and clear. The action is entirely mechanical and the pay station has no electrical connection with the telephone. The machines are so simply and substantially constructed that they should last indefinitely. The principal wear is on the coin itself, so there is but little to get out of order. If, however, there should be any reason for repairs, the station can be quickly detached, another set in its place and the defective machine taken to the shop.

One of the strongest features is the coin-rejecting device. If a coin is dropped in the wrong slot, which might easily happen, by mistake, especially if the machine is in a dark place, it is immediately returned to the party putting it in.

To protect the money deposited in the station it is fitted with a combination lock, making it as secure as a safe or bank vault, so far as lock security is concerned. Each lock is set on a different combination and each has several changes. In addition to this, the locks are interchangeable and a lock can simply be shifted to another machine at any time. This would effectively throw off the track any dishonest discharged employe who had the combination book. Prying open the box is out of the question, as the cash drawer fits flush, affording no hold for any instrument, and



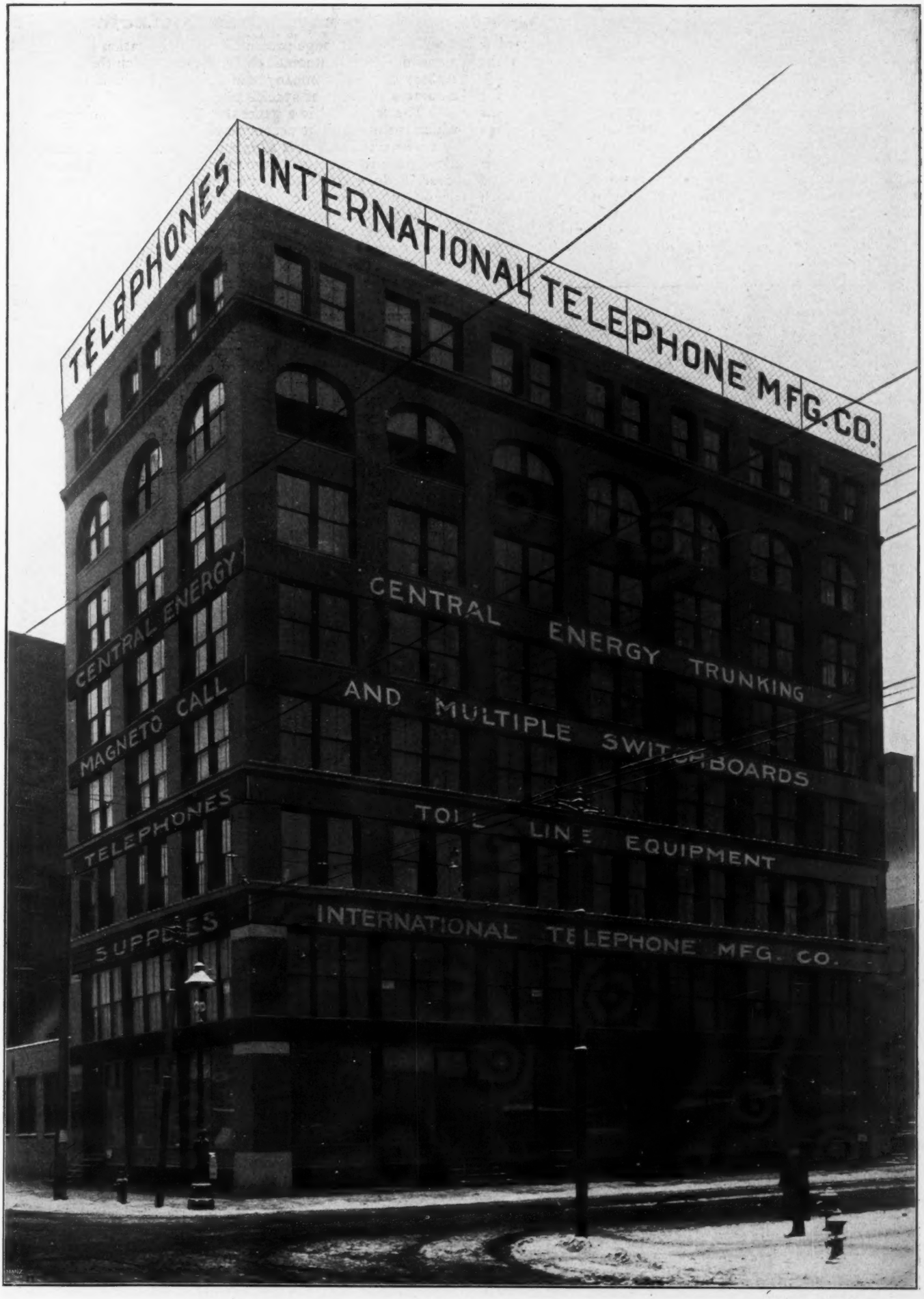
PAY STATION DEVICE. TELEPHONE PAY STATION COMPANY.

the balance of the case is cast in one piece of soft, gray iron.

In addition to the features noted the price of these machines is very reasonable and the money spent for them is a good investment.

It is claimed the use of the Chicago pay station will mean a saving of time to the operator, the patron, the store proprietor and the line. Every second saved means the transaction of more business on a single switchboard.

Every time the telephone is used the service is paid for. This increases the revenue, and "Service for Revenue" is the motto of the progressive manager of to-day.



FACTORY OF THE INTERNATIONAL TELEPHONE MANUFACTURING COMPANY, CHICAGO.

GOOD ADVERTISING WORK.

The following, concerning the Kellogg Switchboard & Supply Company's advertising matter, is taken from the January issue of Profitable Advertising:

"The advertising literature now being issued by the Kellogg Switchboard & Supply Company, Chicago, seems to be the product of somebody who knows how such things ought to be done. The text is well written and convincing, and the illustrations are attractively finished. A specimen of the latter is shown in the half-tone on this page, used as a cover design for the Kellogg Bulletin No. 5, which deals with transmitters and receivers.

"From the standpoint of the layman the most interesting of the booklets recently issued is Bulletin No. 6, on

COVER DESIGN KELLOGG BULLETIN NO. 5

'How to Construct Rural Telephones.' This brochure contains a fund of 'practical information and facts in regard to telephones and telephone lines,' and is likely to imbue the reader with a desire to have a telephone of his own, in whatever locality he may reside.

"From one of the circulars the following data is obtained: The Kellogg Switchboard & Supply Company was organized in 1897. Its apparatus has gained an enviable reputation, and the concern was awarded the only gold medal on the merits of its 'apparatus and systems' by the Pan-American Exposition. The liberal policy of the company has attracted to its employ the best experts, experimenters and skilled mechanics to be found in this country.

"Fred L. Martin, advertising manager, is responsible for the excellence of the Kellogg literature."

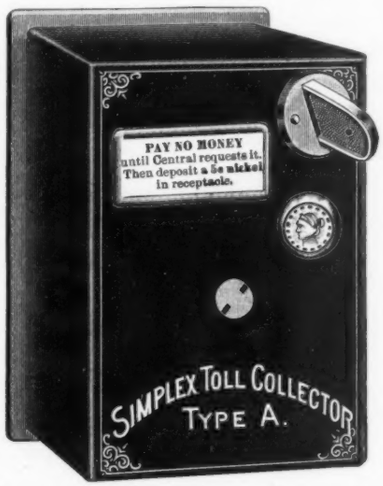
Why don't you subscribe for TELEPHONY?

AUTOMATIC TOLL COLLECTOR.

Mr. H. C. Dodge presents for consideration of the trade a new design of automatic toll collector, which the Williams-Abbott Electric Company will handle, which, it is claimed, embraces features of special merit.

The following is a general description of the appliance, which is shown in the accompanying cut:

The construction is simple and the number of parts employed are reduced to a minimum. Use of a push-button or lever is done away with, the machine being automatic in operation. The subscriber is simply required to place the coin in the receptacle provided for the same at the request of the operator. The coin, in passing through the guide, transmits an absolutely reliable aural signal to the exchange operator. The toll box may be placed in any convenient position; the signal is electrically transmitted and not affected by distance between the toll box and telephone. The instrument is adapted for use in connection with any telephone, magneto call or central battery, wall or desk set. The case is as nearly burglarproof as it is practicable to make a device of the kind; is of cast steel with double lock, so constructed that an inspector may open an outer case in order to test the working parts, and for receiving cash, a separate inner box or safe with an independent lock is provided. The mechanism of the register is operated and signal



transmitted by no coin other than a five-cent nickel, or one of similar size; a larger coin cannot be inserted in the slot and small ones pass through the guide into a separate receptacle without operating the signal. No coin can be attached to a string or wire and withdrawn after giving a signal; a slug of thin material or rings, which are used so frequently to beat slot machines, avail nothing with this instrument. The last coin dropped remains visible beneath a glass until another one is dropped, this feature tending to stop the dishonest practice of employing worthless coins or slugs to operate the instrument. Tolls up to 25 cents can be conveniently collected with this single slot machine, as each coin dropped gives an automatically transmitted aural communication to central office without the assistance of a lever or button to displace the coin before another can be deposited, each coin automatically displacing the one before it.

To illustrate the popularity of coin-operated telephones, it is only necessary to call attention to the fact that the Chicago Telephone Company has during the past year installed 20,000 nickel-in-the-slot machines, thus increasing the number of telephones connected from 25,000 to 45,000. A majority of these coin-operated machines are leased to subscribers who agree to deposit one nickel per day, and these instruments are highly remunerative. Every exchange can employ a greater or less number of coin-operated telephones to great advantage, their use increasing revenue and adding to the efficiency and general utility of the service, the subscriber's interests being subserved owing to their use because of reduction of number of deadhead connections.